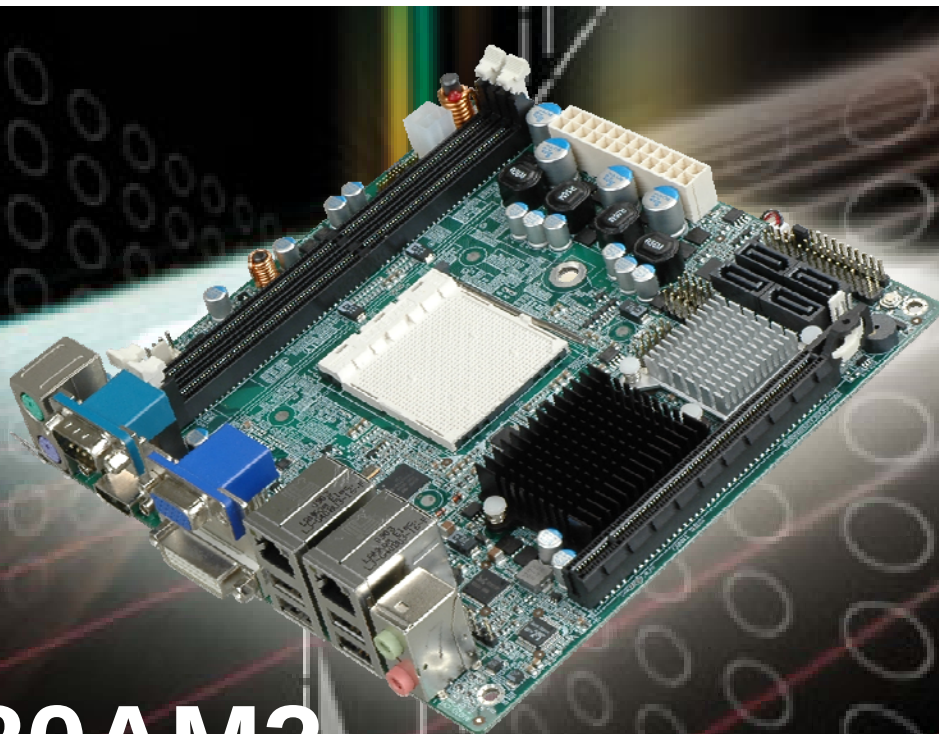




IEI Technology Corp.



MODEL:
KINO-780AM2

**Mini-ITX AMD Socket AM2 with VGA, DVI-I and HDMI
Dual PCIe, USB 2.0, SATA II and Audio**

User Manual

Rev. 1.00 – 23 February 2011



Revision

Date	Version	Changes
23 February 2011	1.02	Deleted "Restore on AC Power Loss" function from BIOS Menu 8
16 November 2009	1.01	Added
1 September 2009	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction

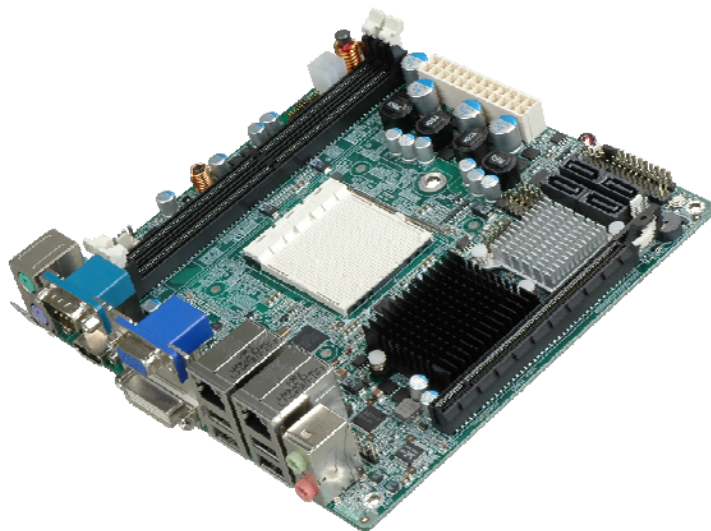


Figure 1-1: KINO-780AM2

The KINO-780AM2 Mini-ITX motherboard has a Socket AM2 CPU socket that supports a AMD® Athlon™ 64, AMD® Athlon™ 64 X2 or AMD® Sempron processor. The board supports VGA, DVI and HDMI graphics output and a PCIe x16 graphics card. The integrated Radeon™ HD3200 graphics core provides hardware-based decoding for UVD, MPEG2 and H.264/AVC formats.

The KINO-780AM2 supports two 2.0GB DDR2 SDRAM DIMMs with clock speeds of up to 800 MHz each.

Expansion is provided by four SATA II ports, eight USB ports, a COM port and two PS/2 ports for a keyboard and mouse.

1.2 Features

Some of the KINO-780AM2 features are listed below.

- Supports the following AMD Socket AM2/AM2+ processors:
 - AMD® Athlon™ 64
 - AMD® Athlon™ 64 X2
 - AMD® Sempron
- Supports two 240-pin DDR2 DIMMs up to 800 MHz and 2.0 GB each

KINO-780AM2 Motherboard

- Multiple graphics outputs
 - VGA
 - HDMI/DVI
 - PCIe x16 graphics card
- Four SATA II drives with transfer rates of 3.0 Gb/s supported
- Eight USB 2.0 devices supported
- One PCIe x16 graphics card supported
- Dual PCIe Gigabit Ethernet connectors
- Mini-ITX form factor
- RoHS compliant

1.3 Connectors

All the connectors are shown in the diagram below.

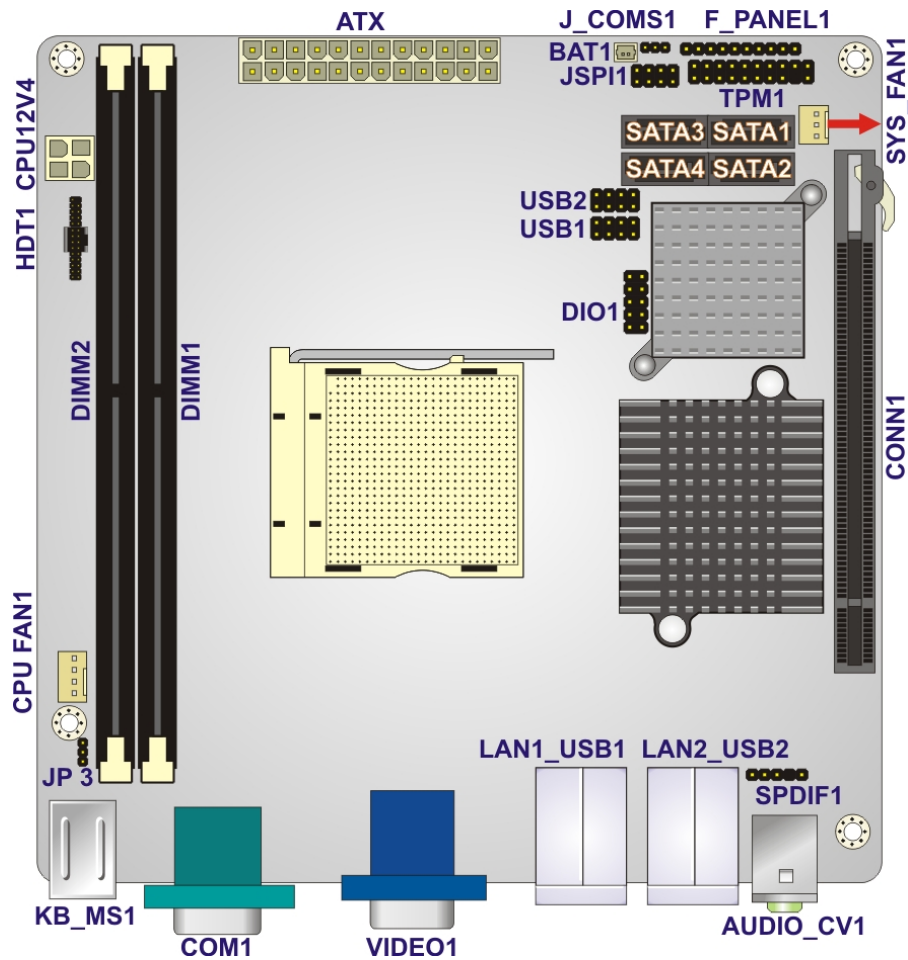


Figure 1-2: KINO-780AM2 Overview

KINO-780AM2 Motherboard

1.4 Dimensions

The dimensions of the board are listed below:

- **Length:** 305mm
- **Width:** 244mm

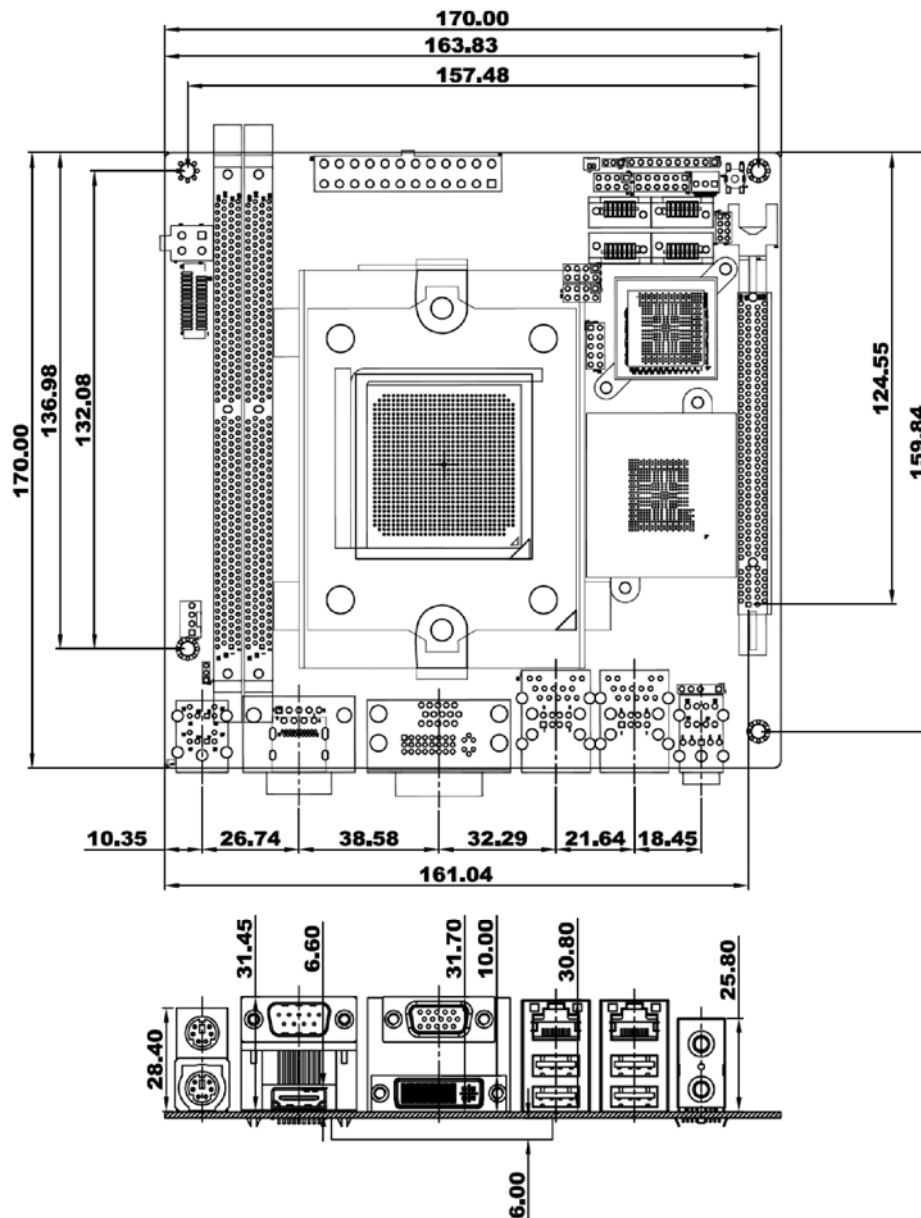


Figure 1-3: KINO-780AM2 Dimensions (mm)

1.5 Data Flow

The diagram below shows the data flow between the chipsets and connectors on the board.

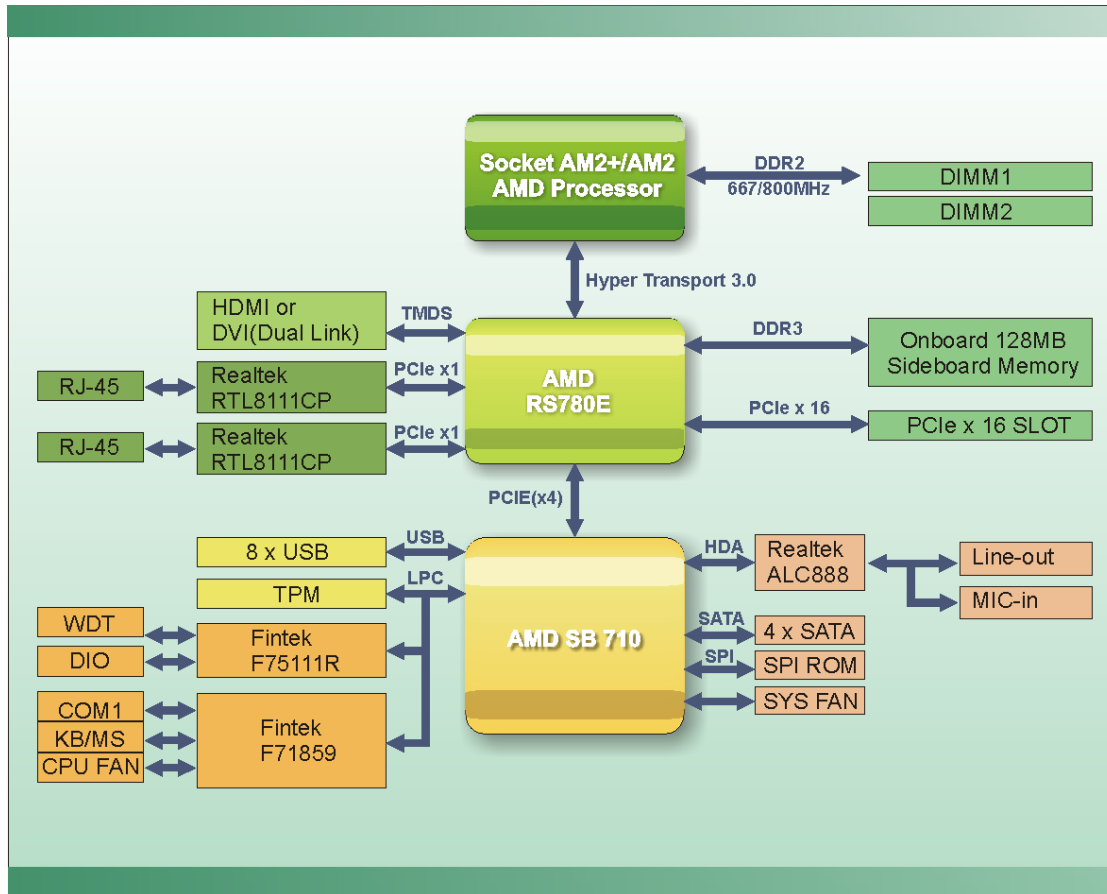


Figure 1-4: Data Flow Block Diagram

1.6 Technical Specifications

All the technical specifications are shown in the table below.

Specification	KINO-780AM2
Form Factor	Mini-ITX
System CPU	AMD® Athlon™ 64 AMD® Athlon™ 64 X2 AMD® Sempron

KINO-780AM2 Motherboard

System Chipset	Northbridge: AMD® RS780E Southbridge: AMD® SB710
Memory	Two 2.0GB DDR2 SDRAM DIMMs with clock speeds of up to 800 MHz each
Super I/O	Fintek F71859
Display Interface	VGA DVI-D HDMI PCIe x16 graphics port
BIOS	AMI Flash BIOS
Audio	Realtek ALC888 High Definition Audio chip
LAN	Two Realtek RTL8111CP PCIe GbE chip
COM	One RS-232 serial port
USB2.0	Eight USB 2.0 devices supported
SATA	Four 3.0Gb/s SATA II drives supported
Keyboard/mouse	Two PS/2 connectors
Expansion	One PCIe x16 slot
Digital I/O	One 8-bit digital input/output connector; 4-bit input/4-bit output
Watchdog Timer	Software programmable 1-255 sec. by Fintek F75111R
Power Supply	ATX power
Power Consumption	5 V @ 4.8 A 12 V @ 0.22 A Vcore 12 V @ 12.69 A 3.3 V @ 0.54 A (AMD® Phenom X4 9950 CPU)
Temperature	0°C – 60°C (32°F - 140°F)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	170 mm x 170 mm

Weight (GW/NW)	1000 g / 450 g
----------------	----------------

Table 1-1: Technical Specifications



NOTE:

Due to the limitation of Windows 32-bit operating system, when more than 4 GB of physical memory is installed, the actual memory available for the operating system is less than 4 GB. The Windows 64-bit operating system doesn't have such limitation.

Chapter

2

Packing List

2.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the KINO-780AM2 may result in permanent damage to the KINO-780AM2 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-780AM2. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-780AM2, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the KINO-780AM2, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-780AM2.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

2.2 Unpacking Precautions

When the KINO-780AM2 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the KINO-780AM2 does not fall out of the box.
- Make sure all the packing list items are included.

KINO-780AM2 Motherboard

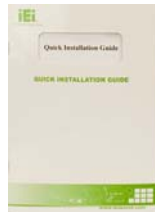
2.3 Packing List



NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the KINO-780AM2 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The KINO-780AM2 is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-780AM2	
1	I/O Shielding (P/N: 45014-0028C0-00-RS)	
4	SATA cables (P/N: 32000-062800-RS)	
1	Mini jumper pack	
1	Quick Installation Guide	

Quantity	Item and Part Number	Image
1	Utility CD	

Table 2-1: Package List Contents

2.4 Optional Items

Item and Part Number	Image
CPU cooler (up to 65 W) (P/N: CF-478D-RS)	
CPU cooler (up to 120 W) (P/N: CF-478E-RS)	
SATA power cable (P/N: 32100-088600-RS)	
Dual USB cable (w bracket) (P/N: CB-USB02-RS)	
Winbond TPM module (P/N: TPM-WI01-R10)	
Infineon TPM module (P/N: TPM-IN01-R10)	

Table 2-2: Package List Contents

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

Section 3.1.1 shows peripheral interface connector locations. Section 3.2 lists all the peripheral interface connectors seen in Section 3.1.1.

3.1.1 Layout

Figure 3-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

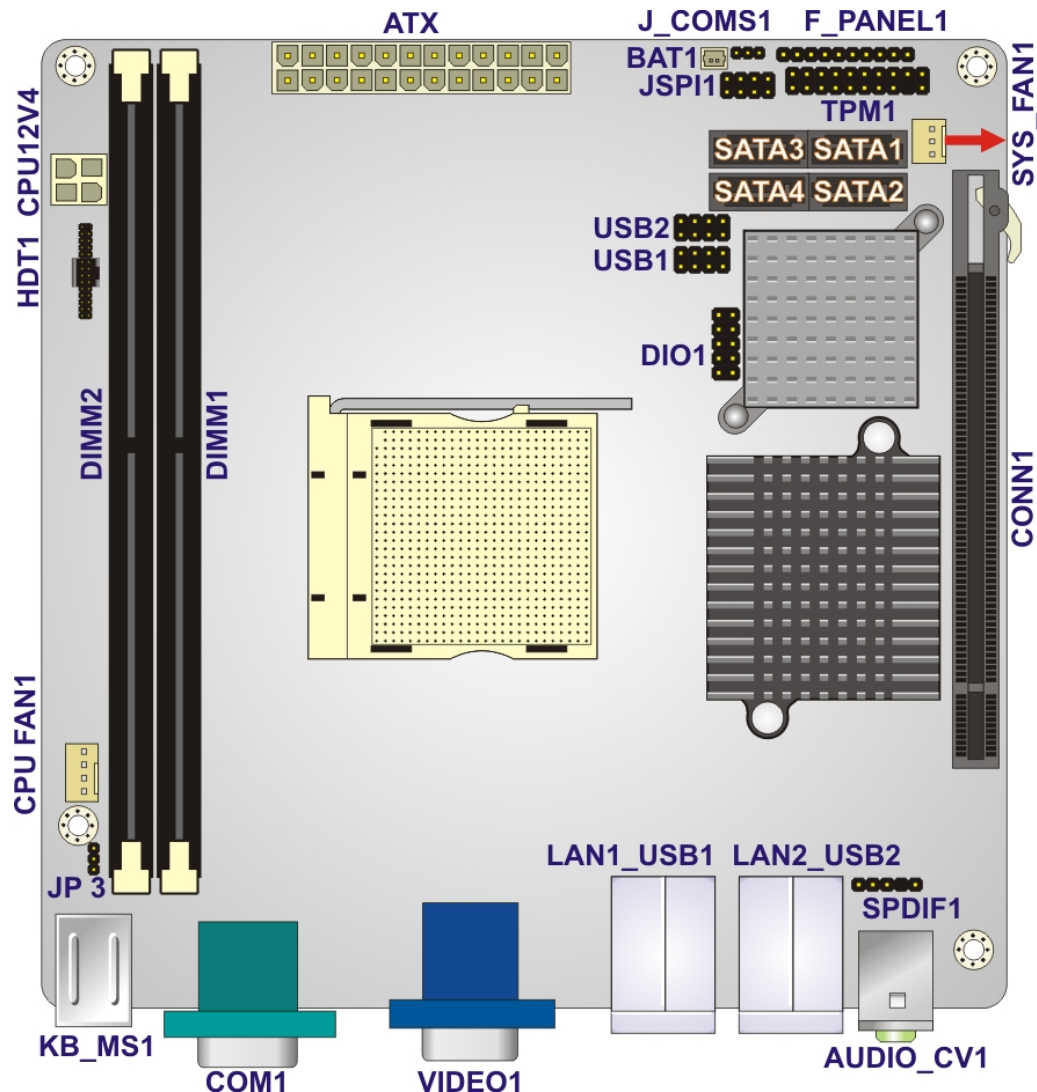


Figure 3-1: Connector and Jumper Locations

KINO-780AM2 Motherboard

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the KINO-780AM2. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power connector	24-pin ATX	ATX1
CPU cooling fan	4-pin wafer	CPU_FAN1
CPU power connector	4-pin connector	CPU12V4
Digital input/output connector	10-pin header	DIO1
Front panel connector	14-pin header	F_PANEL1
PCIe x16 expansion slot	164-pin PCIe slot	PCIE1
Serial ATA drive connector	7-pin SATA	S_ATA1, S_ATA2, S_ATA3, S_ATA4
SPDIF connector	5-pin header	SPDIF1
SPI flash connector	8-pin header	JSPI1
System fan connector	3-pin wafer	SYS_FAN1
TPM connector	20-pin header	TPM1
USB connector	8-pin header	USB1, USB2

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

Table 3-2 lists the rear panel connectors on the KINO-780AM2. Detailed descriptions of these connectors can be found in **Section 3.2.11**.

Connector	Type	Label
Audio connector	Audio jack	AUDIO_CV1
DVI connector	DVI-D	VIDEO1
HDMI connector	HDMI	HDMI1
Keyboard and mouse connector	PS/2	KB_MS1

Connector	Type	Label
LAN connectors	USB	LAN1_USB1B, LAN2_USB2B
Serial port connector	DB-9	COM1
USB connectors	USB	LAN1_USB1B, LAN2_USB2B
VGA connector	DB-15	VIDEO1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the KINO-780AM2.

3.2.1 ATX Power Connector

- CN Label:** ATX1
- CN Type:** 20-pin ATX (2x10)
- CN Location:** See Figure 3-2
- CN Pinouts:** See Table 3-3

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.

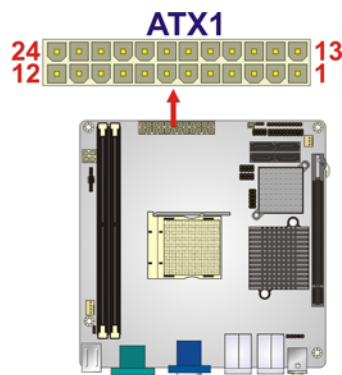


Figure 3-2: ATX Power Connector Pinout Locations

KINO-780AM2 Motherboard

Pin	Description	Pin	Description
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PSON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POK	20	-5V(N/C)
9	5VSB	21	+5V
10	+12V	22	+5V

Table 3-3: ATX Power Connector Pinouts

3.2.2 CPU Fan Connector

CN Label: CPU_FAN1

CN Type: 4-pin header

CN Location: See Figure 3-3

CN Pinouts: See Table 3-4

Connects to the cooling fan on the CPU heatsink.

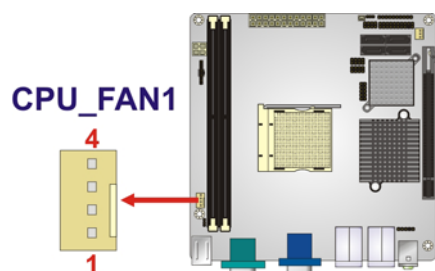


Figure 3-3: CPU Fan Connector Location

Pin	Description
1	GND
2	+12 V
3	Rotation signal

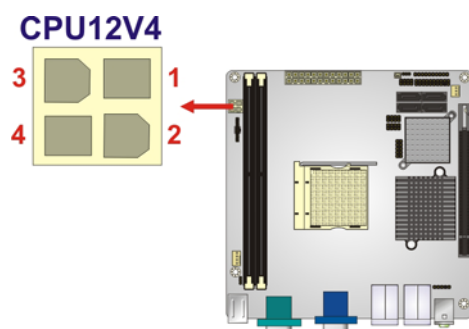
Pin	Description
4	PWM control signal

Table 3-4: CPU Fan Connector Pinouts

3.2.3 CPU Power Connector

CN Label: CPU12V4
CN Type: 4-pin connector
CN Location: See Figure 3-4
CN Pinouts: See Table 3-5

Provides additional 12 V power for the CPU.


Figure 3-4: CPU Power Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	+12 V	4	+12 V

Table 3-5: CPU Power Connector Pinouts

3.2.4 Digital I/O Connector

CN Label: DIO1
CN Type: 10-pin header (2x5)
CN Location: See Figure 3-5
CN Pinouts: See Table 3-6

KINO-780AM2 Motherboard

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

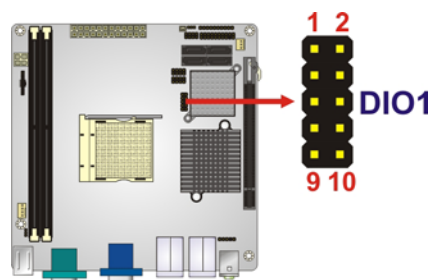


Figure 3-5: DIO Connector Locations

Pin	Description	Pin	Description
1	GND	2	+5V
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-6: DIO Connector Pinouts

3.2.5 Front Panel Connector

CN Label:	F_PANEL1
CN Type:	14-pin header (2x7)
CN Location:	See Figure 3-6
CN Pinouts:	See Table 3-7

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

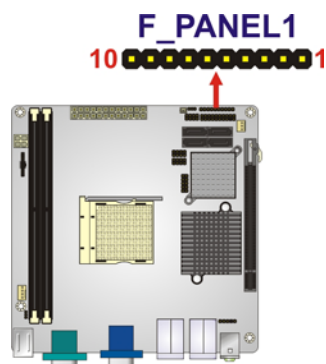


Figure 3-6: Front Panel Connector Location

Pin	Description
1	NC
2	Power +
3	Power -
4	Hard drive LED +
5	Hard drive LED -
6	Power LED +
7	Power LED +
8	Power LED -
9	Reset +
10	Reset -

Table 3-7: Front Panel Connector Pinouts

3.2.6 PCI Express x16 Slot

CN Label: CONN1

CN Type: PCIe x16 slot

CN Location: See Figure 3-7

This slot is for installing a PCIe x16 graphics card.

KINO-780AM2 Motherboard

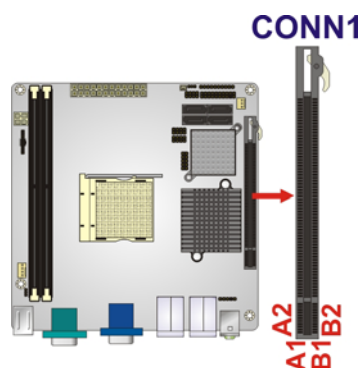


Figure 3-7: PCIe x16 Slot Location

3.2.7 SATA Drive Connectors

CN Label: S_ATA1, S_ATA2, S_ATA3, and S_ATA4

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 3-8

CN Pinouts: See Table 3-8

The SATA drive connectors are each connected to SATA drives. The SATA connectors support up to 3.0 Gb/s transfer.

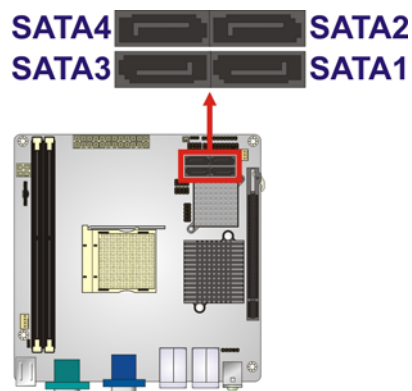


Figure 3-8: SATA Drive Connector Locations

Pin	Description
1	GND
2	TX +
3	TX-

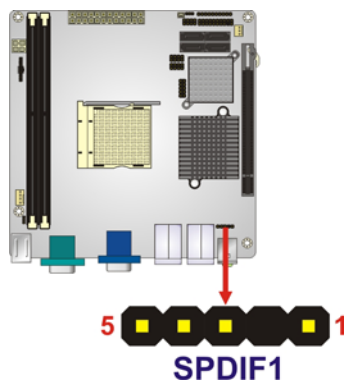
Pin	Description
4	GND
5	RX-
6	RX+
7	GND

Table 3-8: SATA Drive Connector Pinouts

3.2.8 SPDIF Connector

- CN Label:** SPDIF1
- CN Type:** 5-pin header
- CN Location:** See Figure 3-9
- CN Pinouts:** See Table 3-9

Use the SPDIF connector to connect digital audio devices to the system.


Figure 3-9: SPDIF Connector Pinout Locations

Pin	Description
1	VCC
2	NC
3	SPDIF out
4	GND
5	SPDIF in

Table 3-9: SPDIF Connector Pinouts

KINO-780AM2 Motherboard

3.2.9 SPI Flash Connector

CN Label:	JSPI1
CN Type:	8-pin header (2x4)
CN Location:	See Figure 3-10
CN Pinouts:	See Table 3-10

The 8-pin SPI Flash connector is used to flash the BIOS.

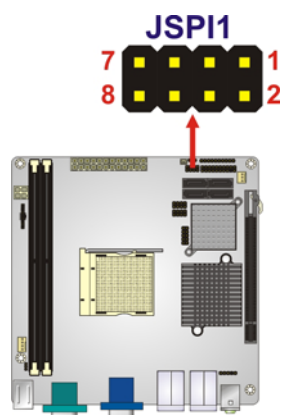


Figure 3-10: SPI Flash Connector Location

Pin	Description	Pin	Description
1	VDD	2	VSS
3	CS#	4	SCK
5	SO	6	SI
7	N/C	8	N/C

Table 3-10: SPI Flash Connector Pinouts

3.2.10 System Fan Connector

CN Label:	SYS_FAN1
CN Type:	3-pin header
CN Location:	See Figure 3-11
CN Pinouts:	See Table 3-11

Connects to the system cooling fan.

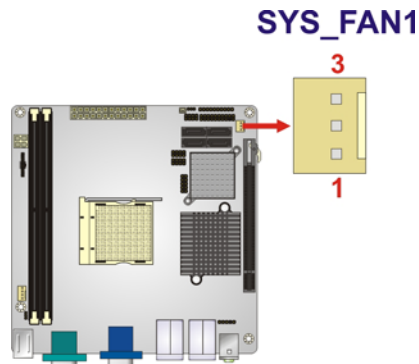


Figure 3-11: System Fan Connector Location

Pin	Description
1	Rotation signal
2	+12 V
3	GND

Table 3-11: System Fan Connector Pinouts

3.2.11 TPM Connector

- CN Label:** TPM1
- CN Type:** 20-pin header (2x10)
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-12**

The Trusted Platform Module (TPM) connector secures the system on bootup.

KINO-780AM2 Motherboard

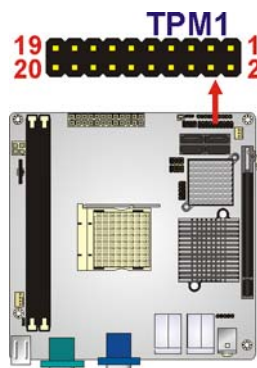


Figure 3-12: TPM Connector Pinout Locations

Pin	Description	Pin	Description
1	LCLK	2	GND2
3	LFRAME#	4	KEY
5	LRESET#	6	+5 V
7	LAD3	8	LAD2
9	+3 V	10	LAD1
11	LAD0	12	GND3
13	SCL	14	SDA
15	SB3 V	16	SERIRQ
17	GND1	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 3-12: TPM Connector Pinouts

3.2.12 USB Connectors

- CN Label:** USB1 and USB2
- CN Type:** 8-pin header (2x4)
- CN Location:** See Figure 3-13
- CN Pinouts:** See Table 3-13

The USB connectors connect to USB devices. Each pin header provides two USB ports.

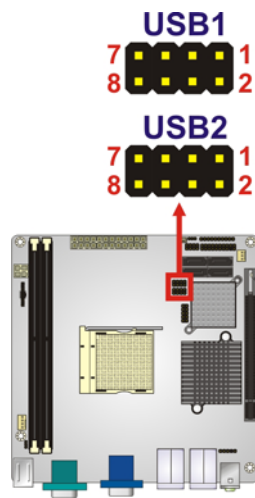


Figure 3-13: USB Connector Pinout Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATAN-	4	DATA1M+
5	DATAN+	6	DATAM-
7	GND	8	VCC

Table 3-13: USB Port Connector Pinouts

3.3 External Peripheral Interface Connector Panel

Figure 3-14 shows the KINO-780AM2 external peripheral interface connector panel.

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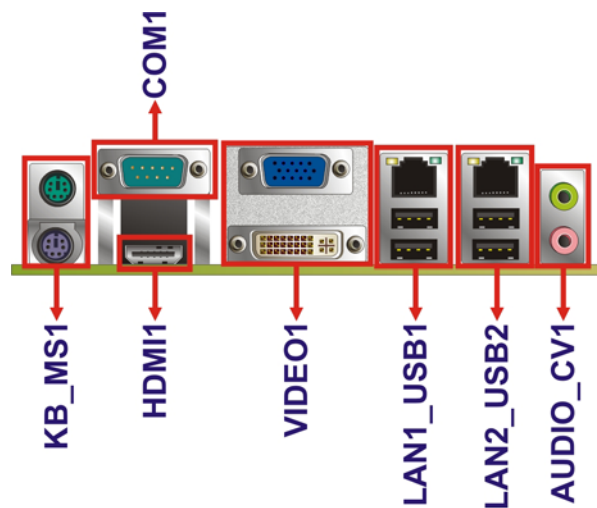


Figure 3-14: KINO-780AM2 External Peripheral Interface Connector

3.3.1 Audio Connector

CN Label:	AUDIO_CV1
CN Type:	2 x audio jacks
CN Location:	See Figure 3-14

The three audio jacks on the external audio connector enable the KINO-780AM2 to be connected to external audio devices as specified below.

- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.



Figure 3-15: Audio Connector

3.3.2 DVI Connector

- CN Label:** VIDEO1
- CN Type:** DVI-D
- CN Location:** See Figure 3-14
- CN Pinouts:** See Table 3-14 and Figure 3-16

Connects to a display that accepts DVI video input.

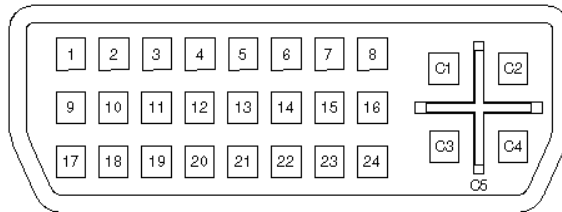


Figure 3-16: DVI-D Connector Pinouts

Pin	Description	Pin	Description	Pin	Description
1	TMDS Data2-	9	TMDS Data1-	17	TMDS Data0-
2	TMDS Data2+	10	TMDS Data1+	18	TMDS Data0+
3	GND	11	GND	19	GND
4	N/C	12	NC	20	NC
5	N/C	13	NC	21	NC
6	DDC Clock [SCL]	14	PVDD1	22	GND
7	DDC Data [SDA]	15	GND	23	TMDS Clock +
8	Analog vertical sync	16	GND	24	TMDS Clock -
C1	N/C	--	--	--	--
C2	N/C	--	--	--	--
C3	N/C	--	--	--	--
C4	N/C	--	--	--	--
C5	N/C	--	--	--	--

Table 3-14: DVI-D Connector Pinouts

3.3.3 HDMI Connector

- CN Label:** HDMI1

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CN Type: HDMI connector

CN Location: See Figure 3-14

CN Pinouts: See Table 3-15

Connects to a screen or device that accepts HDMI video input.

Pin	Description	Pin	Description
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

Table 3-15: HDMI Connector

3.3.4 Keyboard/Mouse Connector

CN Label: KB_MS1

CN Type: Dual PS/2

CN Location: See Figure 3-14

CN Pinouts: See Figure 3-17 and Table 3-16

The KINO-780AM2 keyboard and mouse connectors are standard PS/2 connectors.

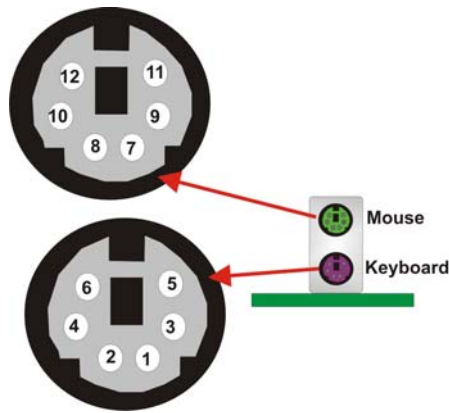


Figure 3-17: PS/2 Pinouts

Pin	Description
1	Keyboard data
2	NC
3	GND
4	VCC
5	Keyboard clock
6	NC
7	Mouse data
8	NC
9	GND
10	VCC
11	Mouse clock
12	NC

Table 3-16: PS/2 Connector Pinouts

3.3.5 LAN and Dual USB Combo Connectors

CN Label: LAN1_USB1B and LAN2_USB2B

CN Type: RJ-45 and two USB

CN Location: See Figure 3-14

CN Pinouts: See Table 3-17 and Table 3-19

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The KINO-780AM2 is equipped with two built-in RJ-45 GbE controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

Pin	Description	Pin	Description
1	X0+	2	X0-
3	X1+	4	X2+
5	X2-	6	X1-
7	X3+	8	X3-

Table 3-17: LAN Pinouts



Figure 3-18: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See Table 3-18.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
Orange	GbE Lan	Yellow	Activity
Green	10/100 Lan		

Table 3-18: RJ-45 Ethernet Connector LEDs

The KINO-780AM2 has four external USB 2.0 ports. The ports are integrated into two dual USB and LAN combo connectors. The USB ports connect to both USB 2.0 and USB 1.1 devices.

Pin	Description
1	USBVCC
2	DATA-
3	DATA+

Pin	Description
4	USBGND

Table 3-19: USB Port Pinouts

3.3.6 Serial Port Connector

CN Label:	COM1
CN Type:	DB-9 connectors
CN Location:	See Figure 3-14
CN Pinouts:	See Table 3-20 and Figure 3-19

Connects to an RS-232 device or network.

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 3-20: Serial Port Pinouts

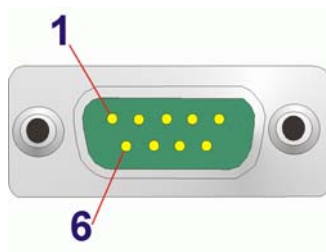


Figure 3-19: Serial Port Location

3.3.7 VGA Connector

CN Label:	VIDEO1
CN Type:	DB-15
CN Location:	See Figure 3-14

KINO-780AM2 Motherboard

CN Pinouts: See Table 3-21 and Figure 3-20

The female DB-15 VGA connector connects to standard VGA displays. The connector and pinouts are shown below.

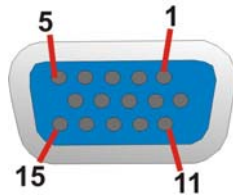


Figure 3-20: VGA Connector

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-21: VGA Connector Pinouts



Chapter

4

Installation

KINO-780AM2 Motherboard

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the KINO-780AM2 may result in permanent damage to the KINO-780AM2 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-780AM2. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-780AM2, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the KINO-780AM2, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-780AM2.
- ***Only handle the edges of the PCB:*** - When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the KINO-780AM2 is installed. All installation notices pertaining to the installation of the KINO-780AM2 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the KINO-780AM2 and injury to the person installing the motherboard.

4.2.1 Installation Notices



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the KINO-780AM2, KINO-780AM2 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
 - The user manual provides a complete description of the KINO-780AM2 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the KINO-780AM2 on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the KINO-780AM2 off:
 - When working with the KINO-780AM2, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

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Before and during the installation of the KINO-780AM2 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.2 Installation Checklist

The following checklist is provided to ensure the KINO-780AM2 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The jumpers have been properly configured
- The KINO-780AM2 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
 - ☐ SATA drives
 - ☐ Keyboard and mouse cable
 - ☐ Audio kit
 - ☐ Power supply
 - ☐ USB cable
 - ☐ Serial port cable
- The following external peripheral devices are properly connected to the chassis:
 - ☐ Screen
 - ☐ Keyboard
 - ☐ Mouse
 - ☐ LAN
 - ☐ VGA screen

4.3 CPU, CPU Cooling Kit and DIMM Installation

**WARNING:**

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, KINO-780AM2 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the KINO-780AM2. If one of these components is not installed the KINO-780AM2 cannot run.

4.3.1 CPU Installation

**WARNING:**

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket AM2 CPU onto the KINO-780AM2, follow the steps below:

**WARNING:**

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

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- Step 1: Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.
- Step 2: Open the CPU socket lever.** Disengage the load lever by moving the lever slightly outward to clear the retention tab. Rotate the load lever to a fully open position. See Figure 4-1.
- Step 3: Orientate the CPU properly.** Make sure the IHS (Integrated Heat Sink) side is facing upward. See Figure 4-1.
- Step 4: Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See Figure 4-1.

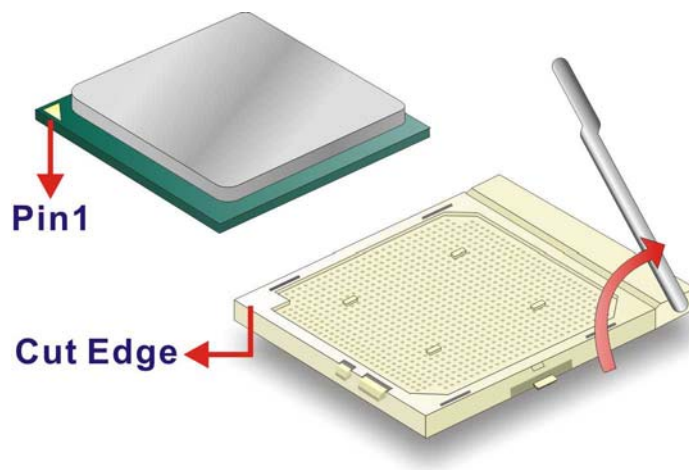


Figure 4-1: Install the CPU

- Step 5: Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.
- Step 6: Close the CPU socket.** Re-engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

4.3.2 Cooling Kit Installation (Screw Type)



Figure 4-2: Cooling Kit

The cooling kit can be bought from IEI. The cooling kit has a heatsink and fan.



WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

- Step 1:** Place the cooling kit onto the socket. Make sure the CPU cable can be properly routed when the cooling kit is installed.
- Step 2:** Properly align the cooling kit. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.
- Step 3:** Mount the cooling kit. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.
- Step 4:** Secure the cooling kit. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See Figure 4-3)

KINO-780AM2 Motherboard

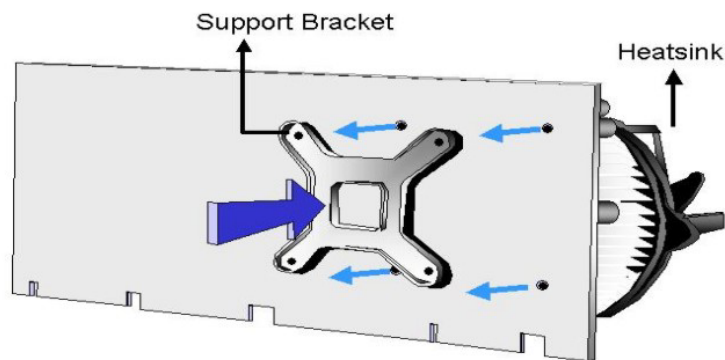


Figure 4-3: Securing the Heat sink to the PCB Board

Step 5: Tighten the screws. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 6: Connect the fan cable. Connect the cooling kit fan cable to the fan connector on the KINO-780AM2. Carefully route the cable and avoid heat generating chips and fan blades.

4.3.3 Cooling Kit Installation (Clip Type)



Figure 4-4: Cooling Kit

A cooling kit can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan. To install the cooling kit, please follow the steps below.

- Step 1:** Spread a proper amount of thermal paste onto the bottom of the cooling fan heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.
- Step 2:** Properly orient the cooling kit. Be sure the cooling kit is properly oriented before installing the cooling kit into the preinstalled cooling kit bracket.
- Step 3:** Install the cooling kit into the preinstalled cooling kit bracket. See Figure 4-5.
- Step 4:** Attach the levered mounting clips. Slip the four levered mounting clips into the clip holes on the cooling kit bracket. See Figure 4-5.
- Step 5:** Secure the cooling kit in place. Gently push the plastic mounting clip down to lock the cooling kit. See Figure 4-5.

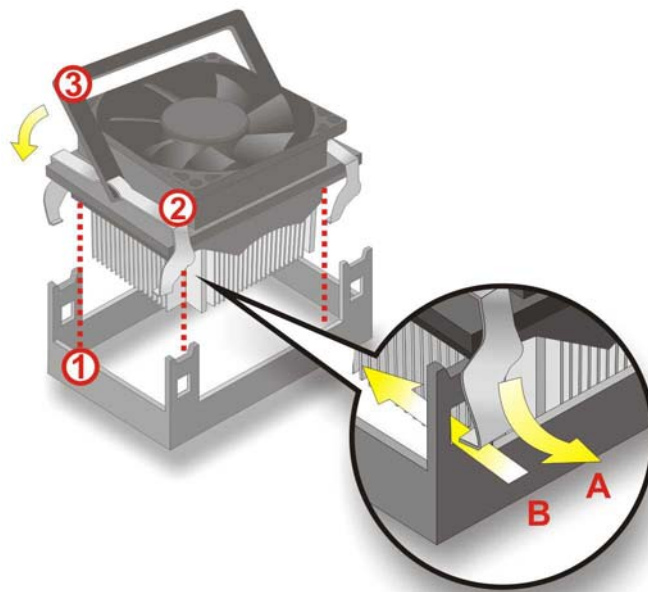


Figure 4-5: Install the CPU cooler

- Step 6:** Connect the fan cable. Connect the cooling kit fan cable to the fan connector on the CPU card. Carefully route the cable and avoid heat generating chips and fan blades.

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4.3.4 DIMM Installation



WARNING:

Using incorrectly specified DIMM may cause permanently damage the KINO-780AM2. Please make sure the purchased DIMM complies with the memory specifications of the KINO-780AM2. DIMM specifications compliant with the KINO-780AM2 are listed in Chapter 2.

To install a DIMM into a DIMM socket, please follow the steps below and refer to Figure 4-6.

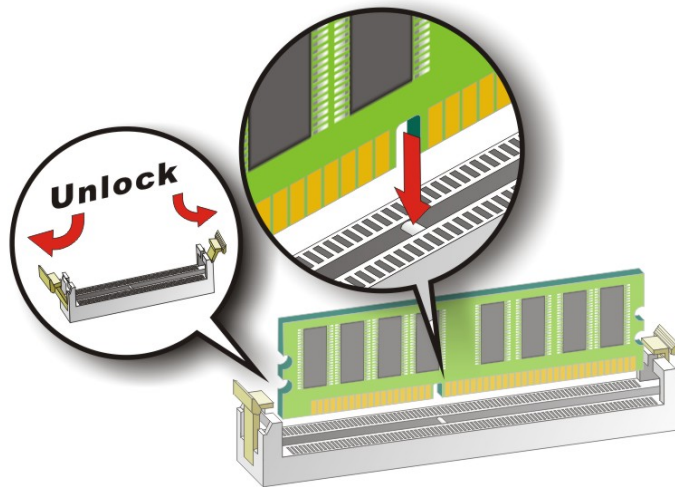


Figure 4-6: Installing a DIMM

- Step 1: Open the DIMM socket handles.** The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See Figure 4-6.
- Step 2: Align the DIMM with the socket.** The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See Figure 4-6.

Step 3: Insert the DIMM. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See Figure 4-6.

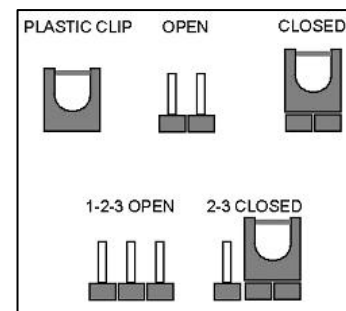
Step 4: Removing a DIMM. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.4 Jumper Settings



NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Before the KINO-780AM2 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the KINO-780AM2 are listed in Table 4-1.

Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header

Table 4-1: Jumpers

4.4.1 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-2
Jumper Location:	See Figure 4-7

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If the KINO-780AM2 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu. The clear CMOS jumper settings are shown in Table 4-2.

Jumper Select	Description
Short 1 - 2	Normal operation
Short 2 - 3	Clear CMOS Setup

Table 4-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in Figure 4-7 below.

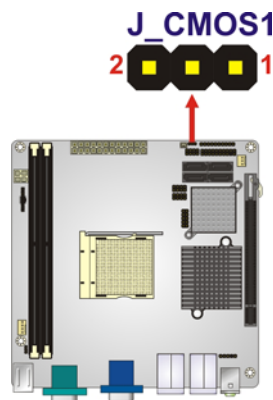


Figure 4-7: Clear CMOS Jumper

4.5 Chassis Installation

4.5.1 Airflow



WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the KINO-780AM2 must have air vents to allow cool air to move into the system and hot air to move out.

The KINO-780AM2 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.5.2 Motherboard Installation

To install the KINO-780AM2 motherboard into the chassis please refer to the reference material that came with the chassis.

4.6 Internal Peripheral Device Connections

This section outlines the installation of external components to the motherboard. Cables included in the package are listed in the unpacking section.

4.6.1 PCIe x16 Expansion Card Installation

A PCIe x16 expansion card can be installed on the KINO-780AM2 using the PCIe x16 expansion slot. To install a PCIe expansion card into the PCIe socket, please follow the steps below.

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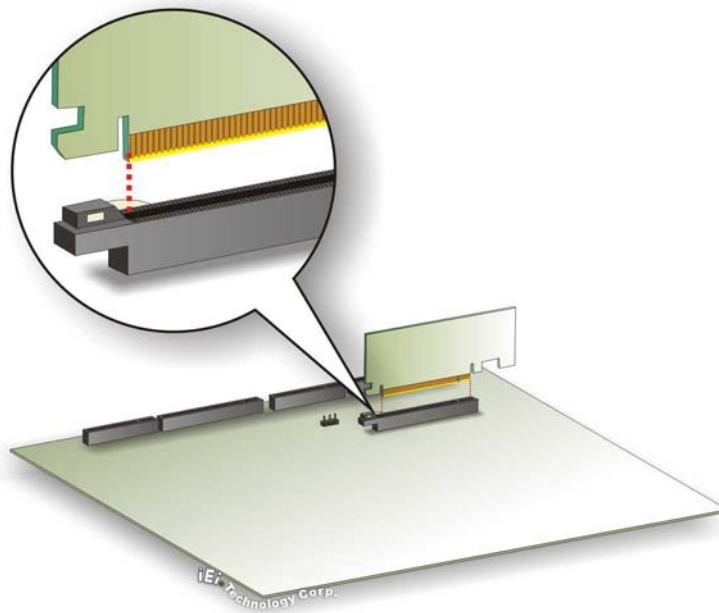


Figure 4-8: PCIe x16 Installation

- Step 1:** **Locate the PCIe x16 socket.** Place the KINO-780AM2 on an anti-static pad with the solder side facing up.
- Step 2:** **Align the PCIe x16 card with the socket.** The PCIe x16 card must be aligned so the notch on the PCIe x16 card aligns with the plastic bridge in the socket.
- Step 3:** **Insert the PCIe x16 card.** Push the PCIe x16 card into the socket, perpendicular to the KINO-780AM2.
- Step 4:** **Secure the PCI x16 card.** Push the PCIe x16 card down until the clip engages, securing the card in place.

4.6.2 SATA Drive Connection

The KINO-780AM2 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

- Step 1:** **Locate the connectors.** The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: Insert the cable connector. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See Figure 4-9.

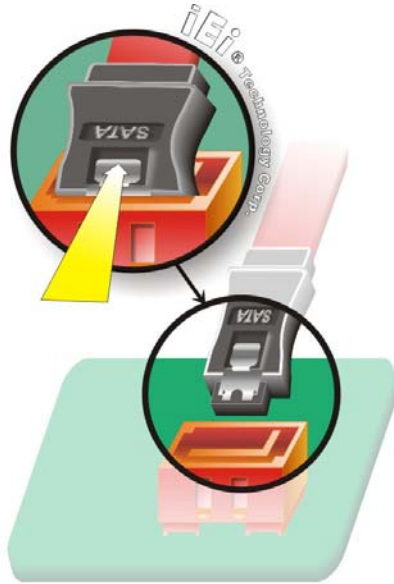


Figure 4-9: SATA Drive Cable Connection

Step 3: Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See Figure 4-10.

Step 4: Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See Figure 4-10.

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Figure 4-10: SATA Power Drive Connection

4.6.3 USB Cable (Four Port)

Four port USB 2.0 cables can be separately purchased from IEI. To install a four port USB cable onto the KINO-780AM2, please follow the steps below.

Step 1: Locate the connectors. The locations of the USB connectors are shown in Chapter 4.



WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: Align the connectors. Each cable has two connectors. Correctly align pin 1 on each cable connector with pin 1 on the KINO-780AM2 USB connectors.

Step 3: Insert the cable connectors. Once the cable connectors are properly aligned with the USB connectors on the KINO-780AM2, connect the cable connectors to the onboard connectors. See Figure 4-11.

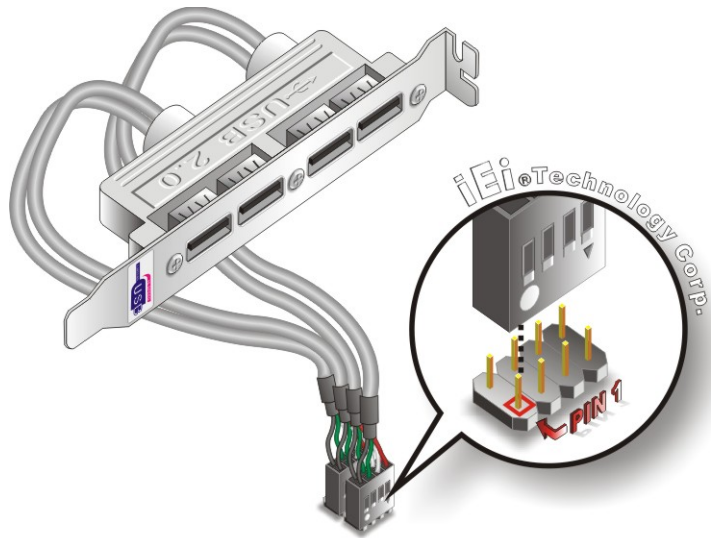


Figure 4-11: Four Port USB Cable Connection

Step 4: **Attach the bracket to the chassis.** The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

4.7 External Peripheral Interface Connection

The connection of external devices to the external connectors are outlined in the subsections below.

4.7.1 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the KINO-780AM2.

Step 1: **Locate the audio phone jacks.** The location of the audio phone jacks are shown in **Chapter 3**.

Step 2: **Insert audio phone jack plugs.** Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See Figure 4-12.

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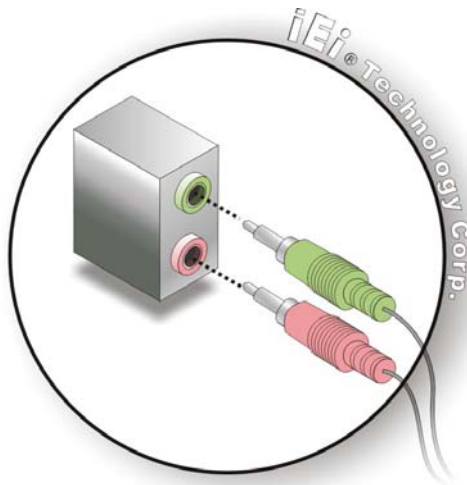


Figure 4-12: Audio Connectors

4.7.2 DVI Display Device Connection

The KINO-780AM2 has a single female DVI connector on the external peripheral interface panel. The DVI connector is connected to a digital display device. To connect a digital display device to the KINO-780AM2, please follow the instructions below.

- Step 1: Locate the DVI connector.** The location of the DVI connector is shown in Chapter 2.
- Step 2: Align the DVI connector.** Align the male DVI connector on the digital display device cable with the female DVI connector on the external peripheral interface.
- Step 3: Insert the DVI connector** Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the KINO-780AM2. See Figure 4-13.

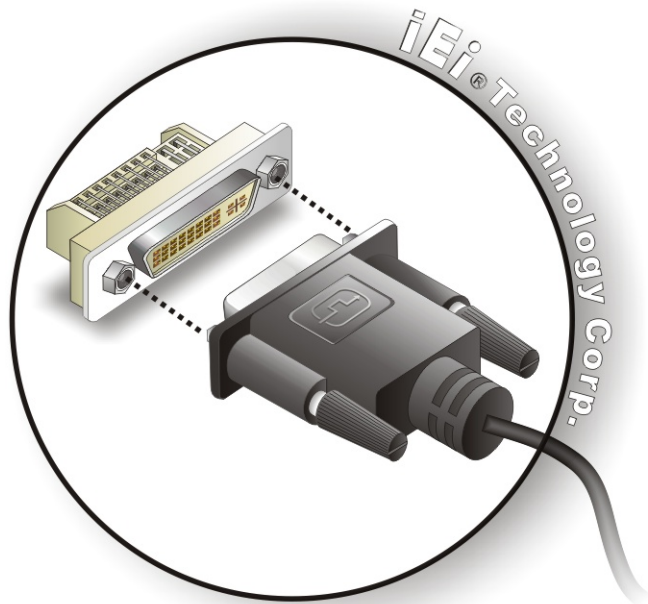


Figure 4-13: DVI Connector

Step 4: Secure the connector. Secure the DVI connector from the digital display device to the external interface by tightening the two retention screws on either side of the connector.

4.7.3 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: Locate the RJ-45 connectors. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: Align the connectors. Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the KINO-780AM2. See Figure 4-14.

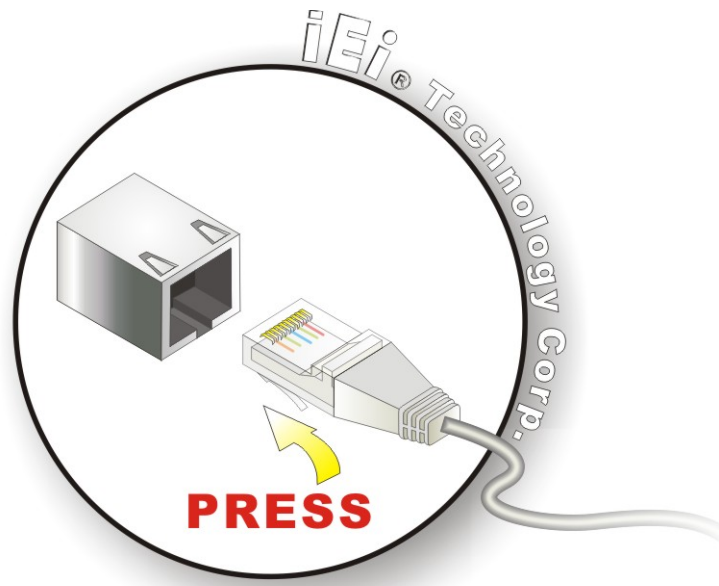


Figure 4-14: LAN Connection

Step 3: Insert the LAN cable RJ-45 connector. Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

4.7.4 PS/2 Keyboard and Mouse Connection

The KINO-780AM2 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the KINO-780AM2.

Step 1: Locate the dual PS/2 connector. The location of the dual PS/2 connector is shown in Chapter 3.

Step 2: Insert the keyboard/mouse connector. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See Figure 4-15.

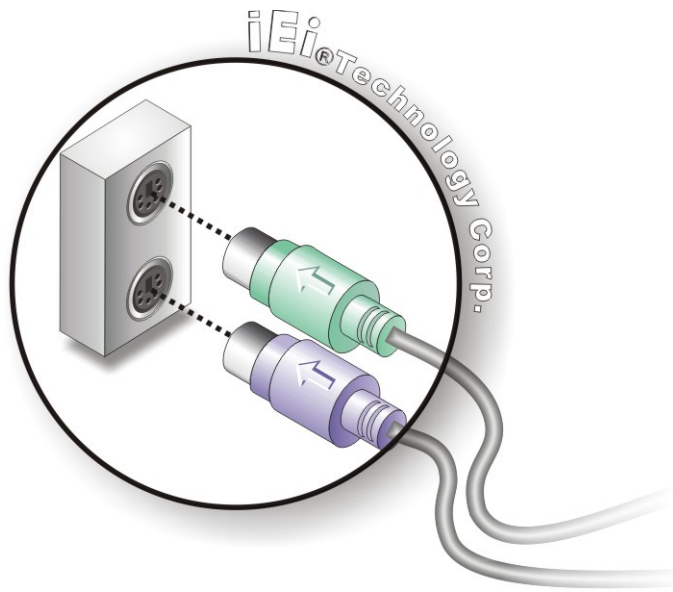


Figure 4-15: PS/2 Keyboard/Mouse Connector

4.7.5 Serial Device Connection

The KINO-780AM2 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the KINO-780AM2.

Step 1: **Locate the DB-9 connector.** The location of the DB-9 connector is shown in Chapter 3.

Step 2: **Insert the serial connector.** Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 4-16.

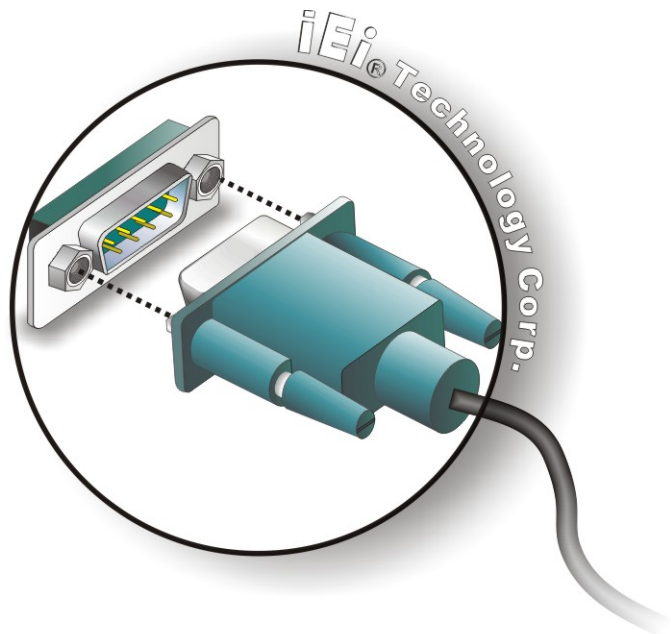


Figure 4-16: Serial Device Connector

Step 3: **Secure the connector.** Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

4.7.6 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the KINO-780AM2.

Step 1: **Locate the USB Series "A" receptacle connectors.** The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug.** Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See Figure 4-17.

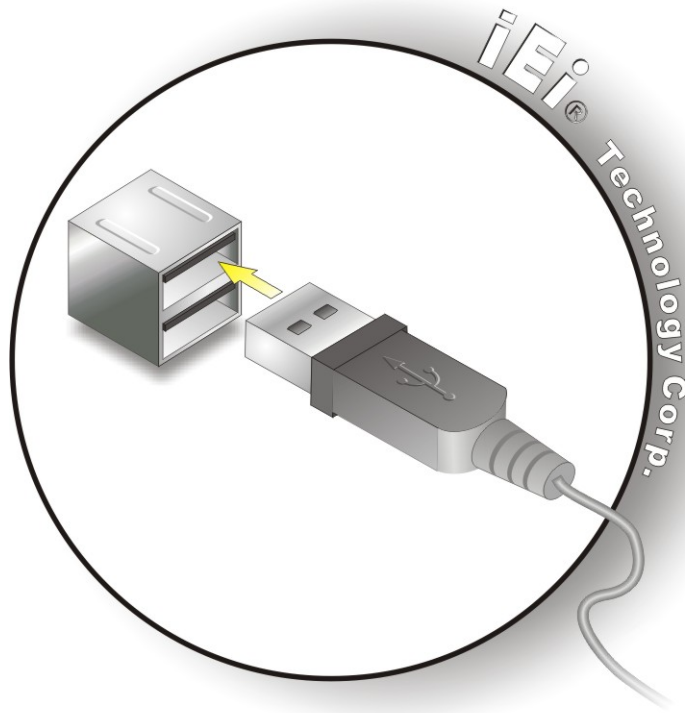


Figure 4-17: USB Connector

4.7.7 VGA Monitor Connection

The KINO-780AM2 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the KINO-780AM2, please follow the instructions below.

- Step 1: Locate the female DB-15 connector.** The location of the female DB-15 connector is shown in **Chapter 3**.
- Step 2: Align the VGA connector.** Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.
- Step 3: Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the KINO-780AM2. See Figure 4-18.

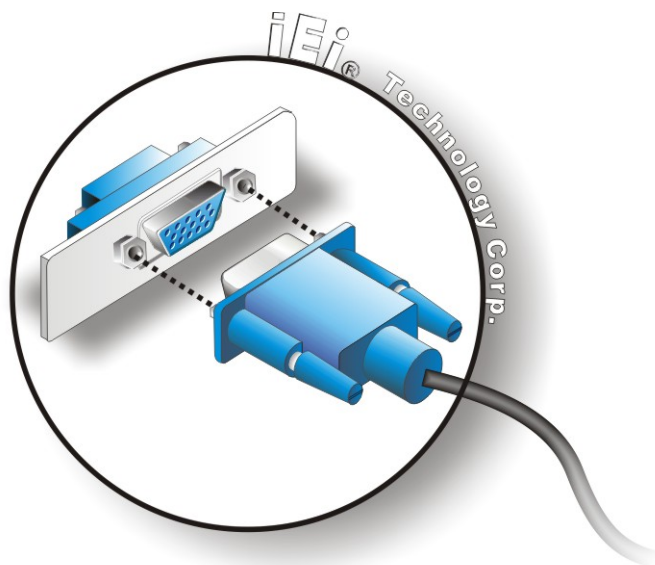


Figure 4-18: VGA Connector

Step 4: **Secure the connector.** Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.8 Driver Installation

All drivers are on the included CD. Refer to the instructions below to start the driver installation program.



NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

Step 1: Insert the CD into a CD drive connected to the system.



NOTE:

If the system does not initiate the "autorun" program when the CD is inserted, click the Start button, select Run, then type X:\autorun.exe (where X:\ is the system CD drive) to access the IEI Driver CD main menu.

Step 2: Select KINO-780AM2 from the drivers list.

Step 3: Install each of the drivers shown in the menu.

4.9 Enabling Hardware Video Acceleration

Hardware acceleration for video playback must be enabled through the configuration options in the included CyberLink PowerDVD software.

Open the configuration screen, select the Video tab and check the box shown below.



Figure 4-19: Video Hardware Acceleration

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the “**Press Del to enter SETUP**” message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **Esc** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

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Key	Function
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter 5.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

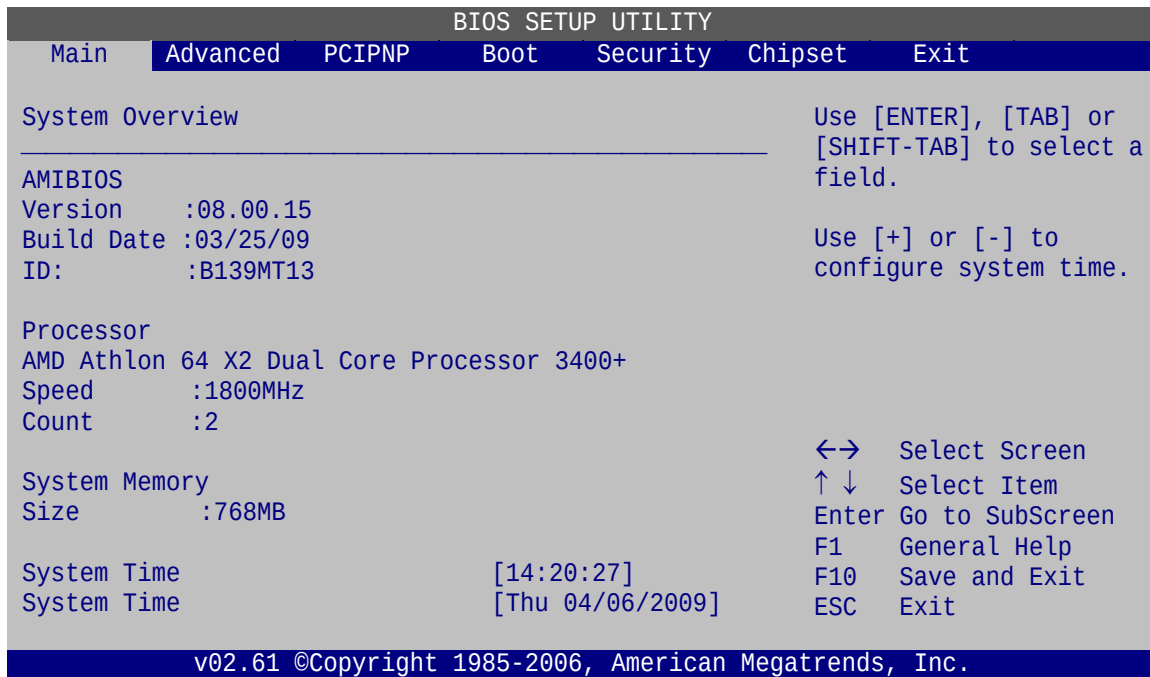
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Power – Changes power management settings.
- Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (BIOS Menu 1) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

- **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- AMI BIOS: Displays auto-detected BIOS information
 - **Version:** Current BIOS version
 - **Build Date:** Date the current BIOS version was made
 - **ID:** Installed BIOS ID
- Processor: Displays auto-detected CPU specifications
 - **Type:** Names the currently installed processor
 - **Speed:** Lists the processor speed
 - **Count:** The number of CPUs on the motherboard
- System Memory: Displays the auto-detected system memory.
 - **Size:** Lists memory size

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The System Overview field also has two user configurable fields:

- **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

- **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

5.3 Advanced

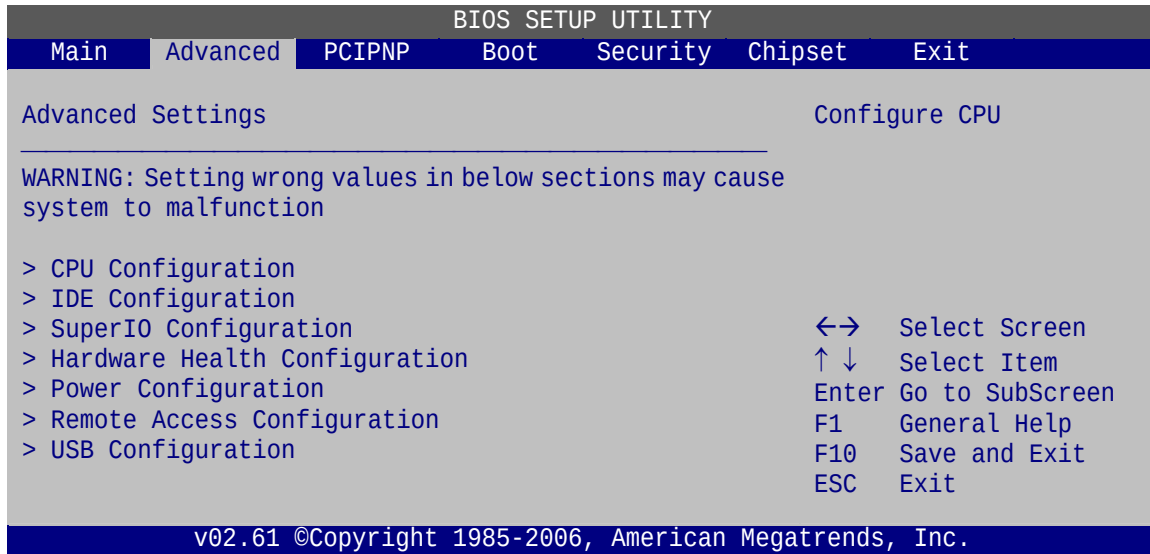
Use the **Advanced** menu (BIOS Menu 2) to configure the CPU and peripheral devices through the following sub-menus:



WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

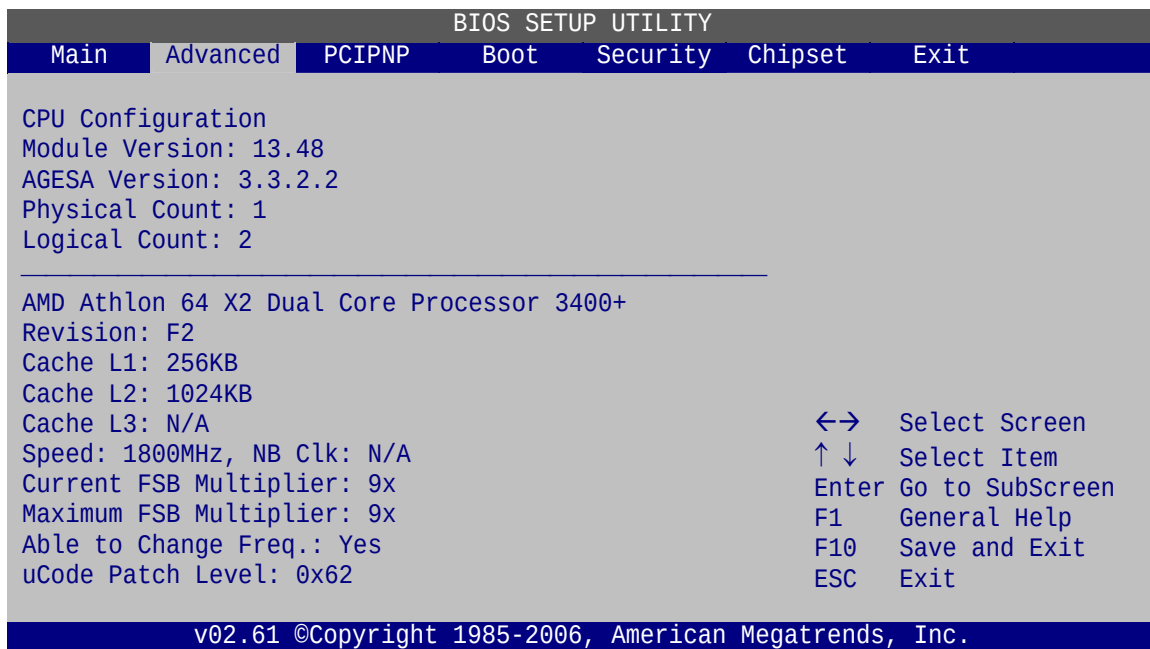
-
- CPU Configuration (see **Section 5.3.1**)
 - IDE Configuration (see **Section 5.3.2**)
 - Super IO Configuration (see **Section 5.3.3**)
 - Hardware Health Configuration (see **Section 5.3.4**)
 - Power Configuration (see **Section 5.3.5**)
 - Remote Access Configuration (see **Section 5.3.6**)
 - USB Configuration (see **Section 5.3.7**)



BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.



BIOS Menu 3: CPU Configuration

The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

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- Manufacturer: Lists the name of the CPU manufacturer
- Brand String: Lists the brand name of the CPU being used
- Frequency: Lists the CPU processing speed
- FSB Speed: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

The following **CPU Configuration** menu items can be configured.

- Max CUPID Value Limit
- Hyper Threading Function
- CPU TM Function
- Intel ® SpeedStep ™ tech.
- Clock Spread Spectrum
- Execute Disable Bit
- CPU TM function

▪ Max CUPID Value Limit



NOTE:

If the OS is NT, this value must be set to enabled.

Use the **Max CUPID Value Limit** BIOS option to disable or enable legacy Oses that can support a CPU with extended CUPID functions.

- ➔ **Disabled** **DEFAULT** Disables legacy Oses that cannot support CPUs with extended CUPID functions from booting up
- ➔ **Enabled** Enables legacy Oses that cannot support CPUs with extended CUPID functions to boot up

▪ Hardware Prefetcher [Enabled]

Use the **Hardware Prefetcher** BIOS option to enable the CPU prefetching data feature.

➔ **Disabled** Does not allow the Hardware Prefetcher Disable feature to be enabled or disabled.

➔ **Enabled** **DEFAULT** Allows the Hardware Prefetcher Disable feature to be either enabled or disabled

▪ **Adjacent Cache Line Prefetch [Enabled]**

Use the **Adjacent Cache Line Prefetch** BIOS option to enable the CPU prefetching data feature.

➔ **Disabled** Does not allow the Adjacent Cache Line Prefetch Disable feature to be enabled or disabled

➔ **Enabled** **DEFAULT** Allows the Adjacent Cache Line Prefetch Disable feature to be either enabled or disabled

▪ **Hyper Threading Function [Disabled]**

Use the Hyper Threading function to enable or disable the CPU hyper threading function.

➔ **Disabled** **DEFAULT** Disables the use of hyper threading technology

➔ **Enabled** Enables the use of hyper threading technology

▪ **Clock Spread Spectrum [Disabled]**

Use the **Clock Spread Spectrum** BIOS option to improve CPU EMI issues.

➔ **Disabled** **DEFAULT** The clock spread spectrum is disabled

➔ **Enabled** The clock spread spectrum is enabled

▪ **Execute Bit Disable [Enabled]**

Use the **Execute Bit Disable** BIOS function to protect the system from buffer overflow attacks.

➔ **Disabled** Code can be executed in any memory area.

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➔ **Enabled** **DEFAULT** Code execution in data-only memory pages is prohibited.

▪ CPU TM Function [Enabled]

Use the **CPU TM Function** option to enable or disable the CPU TM function.

➔ **Disabled** CPU TM Function disabled

➔ **Enabled** **DEFAULT** CPU TM Function enabled

▪ Intel (R) SpeedStep (tm) tech. [Enabled]

Use the **Intel (R) SpeedStep (tm) tech.** option to enable or disable GV3. GV3 technology is a power-saving scheme where the OS optimizes overall power consumption by dynamically changing CPU frequency based on demand.

➔ **Disabled** Disables SpeedStep i.e. GV3

➔ **Enabled** **DEFAULT** Enables SpeedStep i.e. GV3

▪ Intel (R) SpeedStep (tm) tech. [Automatic]

Use the **Intel (R) SpeedStep (tm) tech.** option to set the CPU speed.

➔ **Maximum Speed** CPU speed is set to maximum

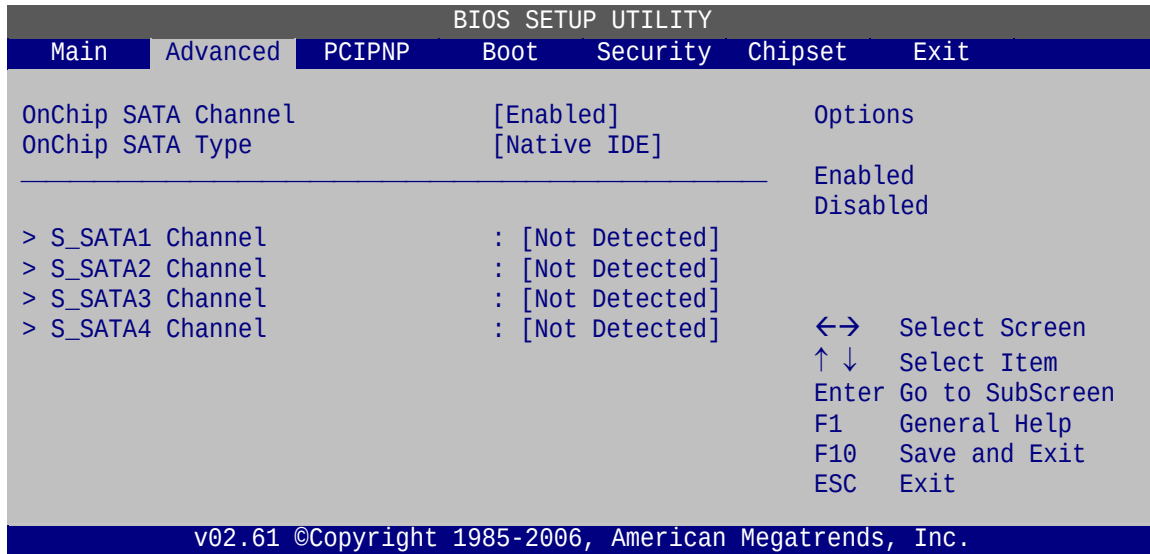
➔ **Minimum Speed** CPU speed is set to minimum

➔ **Automatic** **DEFAULT** CPU speed is set to automatic

➔ **Disabled** CPU speed is disabled

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (BIOS Menu 4) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

- **OnChip SATA Channel [Enabled]**

Toggles the SATA channels on and off

- Enabled **DEFAULT**
- Disabled

- **OnChip SATA Type [Native IDE]**

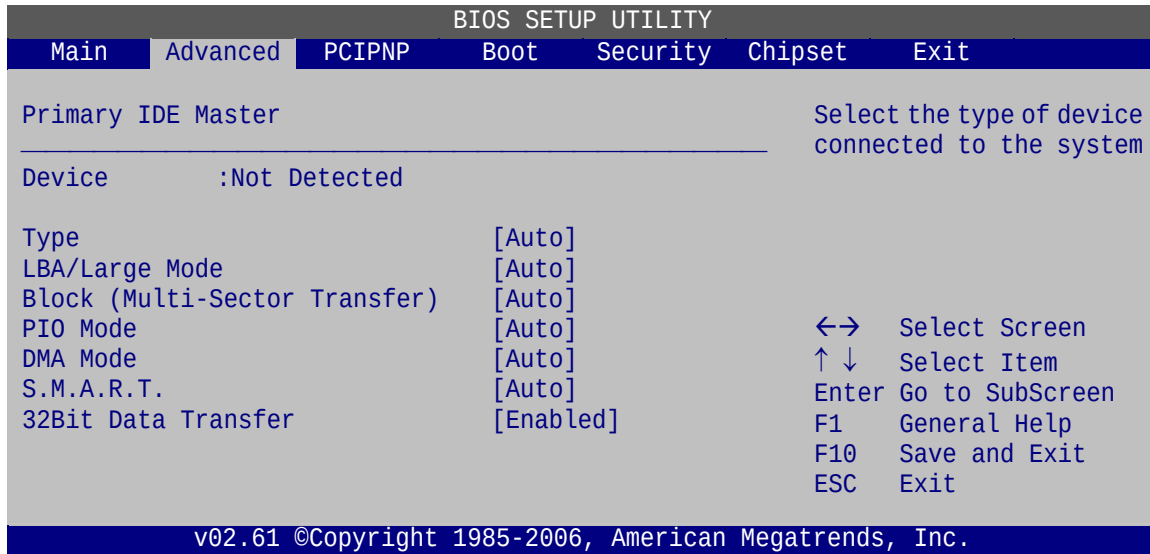
Specifies the operating mode for the SATA connections.

- ➔ **Native IDE** **DEFAULT** Configured to transmit data with using traditional IDE interface. This is the most compatible mode.
- ➔ **Raid Mode** The SATA connectors are setup in a RAID configuration. To set the RAID options, install more than one drive to the SATA connectors then setup at the prompt after system startup.
- ➔ **AHCI Mode** This is an enhanced mode for SATA hard drives.

5.3.2.1 SATA Channel

Sets the IDE configuration of the SATA channels.

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BIOS Menu 5: IDE Master and IDE Slave Configuration

▪ Type [Auto]

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

- ➔ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.
- ➔ **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
- ➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
- ➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:
 - ZIP
 - LS-120

- **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

- ➔ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.
- ➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

- **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

- ➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
- ➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

- **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

- ➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
- ➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s
- ➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s
- ➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s

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- ➔ 3 PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
- ➔ 4 PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s
(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

▪ DMA Mode [Auto]

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

- ➔ **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- ➔ **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s
- ➔ **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s
- ➔ **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s
- ➔ **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s
- ➔ **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s
- ➔ **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s
- ➔ **UDMA0** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s
- ➔ **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s
- ➔ **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s

- ➔ **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

▪ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

- ➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- ➔ **Disabled** Prevents BIOS from using the HDD SMART feature.
- ➔ **Enabled** Allows BIOS to use the HDD SMART feature

▪ **32Bit Data Transfer [Enabled]**

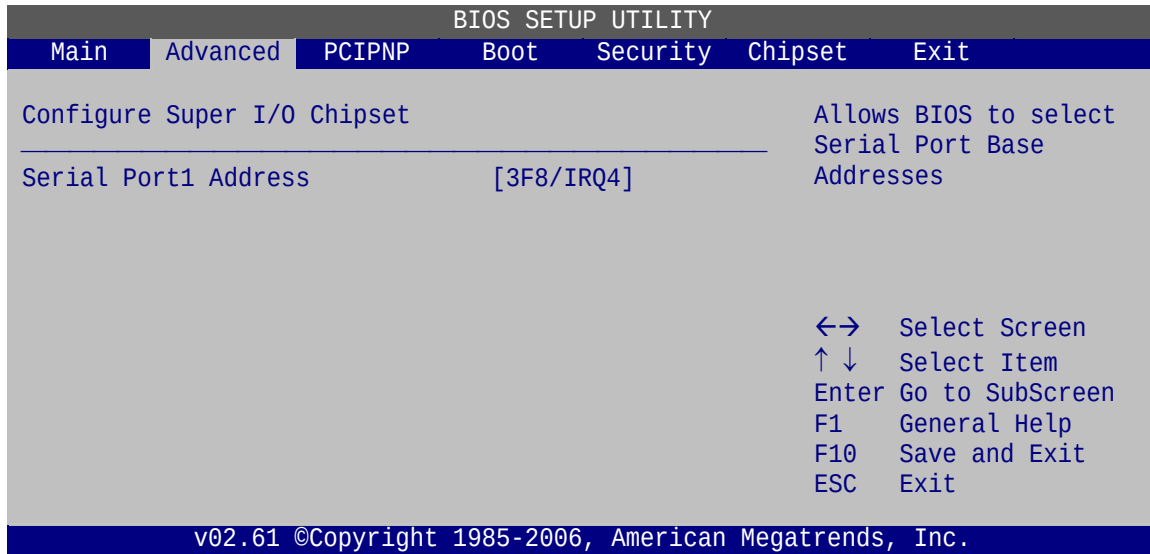
Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

- ➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.
- ➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (BIOS Menu 6) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

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BIOS Menu 6: Super IO Configuration

- Serial Port1 Address [3F8/IRQ4]

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

- ➔ **Disabled** No base address is assigned to Serial Port 1
- ➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
- ➔ **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
- ➔ **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (BIOS Menu 7) shows the operating temperature, fan speeds and system voltages.

BIOS SETUP UTILITY			
Main	Advanced	PCIPNP	Boot Security Chipset Exit
CPU Temperature		:30°C/86°F	
SYS Temperature		:48°C/118°F	
CPU Fan Speed		:3856 RPM	
SYS Fan Speed		:N/A	
DRAM		:1.8771 V	
CPU Core		:2.5165 V	
1.2V		:1.2142 V	
Vcc		:1.1350 V	
NB		:1.1321 V	
1.8V		:1.8976 V	
1.1V		:1.0969 V	
Vcc		:3.344 V	
VSB		:3.376 V	
VBAT		:3.312 V	
		←→	Select Screen
		↑ ↓	Select Item
		Enter	Go to SubScreen
		F1	General Help
		F10	Save and Exit
		ESC	Exit
v02.61 ©Copyright 1985-2006, American Megatrends, Inc.			

BIOS Menu 7: Hardware Health Configuration

- **Hardware Health Monitoring**

The following system parameters and values are shown. The system parameters that are monitored are:

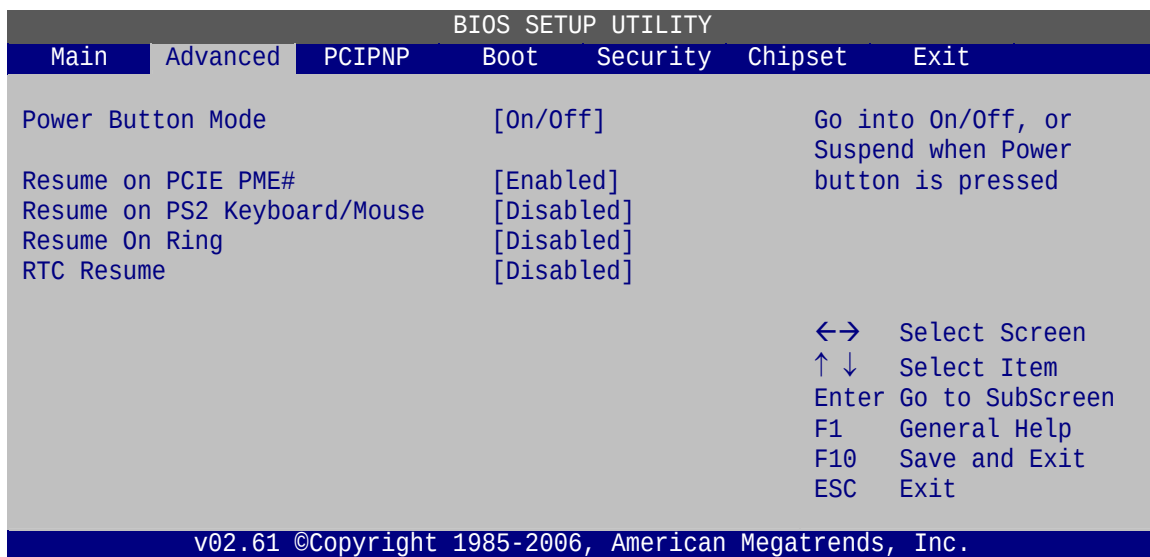
- System Temperatures:
 - CPU temperature
 - System temperature
- Fan Speeds:
 - CPU fan speed
 - System fan speed
- Voltages:
 - DRAM
 - CPU Core
 - 1.2V
 - Vcc

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- ☐ NB
- ☐ 1.8V
- ☐ 1.1V
- ☐ Vcc
- ☐ VSB
- ☐ VBAT

5.3.5 Power Configuration

The **APM Configuration** menu (BIOS Menu 8) allows the advanced power management options to be configured.



BIOS Menu 8: APM Configuration

- **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

- ➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off
- ➔ **Suspend** When the power button is pressed the system goes into suspend mode

- **Resume on PCIE PME# [Disabled]**

Use the **Resume on PCIE PME#** BIOS option to enable activity on the PCI PME (power management event) controller to rouse the system from a suspend or standby state.

- ➔ **Disabled** **DEFAULT** Wake event not generated by PCI PME controller activity
- ➔ **Enabled** Wake event generated by PCI PME controller activity

- **Resume on PS2 Keyboard/Mouse [Disabled]**

Use the **Resume on PS2 Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

- ➔ **Disabled** **DEFAULT** Wake event not generated by activity on the keyboard or mouse
- ➔ **Enabled** Wake event generated by activity on the keyboard or mouse

- **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

- ➔ **Disabled** **DEFAULT** Wake event not generated by an incoming call
- ➔ **Enabled** Wake event generated by an incoming call

- **RTC Resume [Disabled]**

Use the **RTC Resume** option to specify the time the system should be roused from a suspended state.

- ➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

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➔ **Enabled**

If selected, the following appears with values that can be selected:

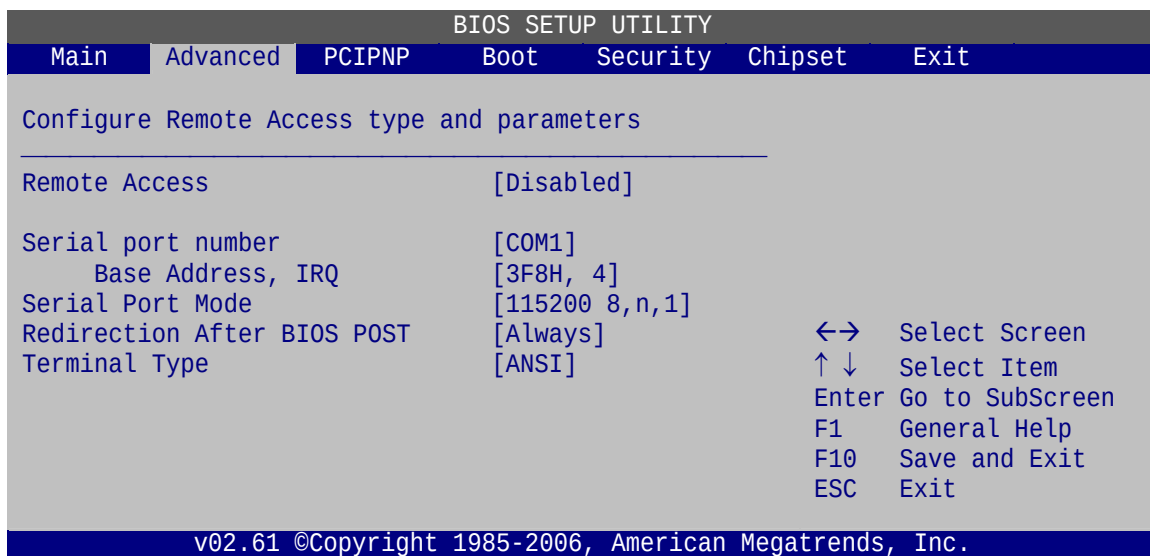
RTC Alarm Date (Days)

System Time

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.6 Remote Access Configuration

Use the **Remote Access Configuration** menu (BIOS Menu 9) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 9: Remote Access Configuration

▪ Remote Access [Disabled]

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled**

DEFAULT

Remote access is disabled.

➔ **Enabled**

Remote access configuration options shown below appear:

Serial Port Number
 Serial Port Mode
 Flow Control
 Redirection after BIOS POST
 Terminal Type
 VT-UTF8 Combo Key Support

These configuration options are discussed below.

▪ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

- ➔ **COM1** **DEFAULT** System is remotely accessed through COM1
- ➔ **COM2** System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

▪ **Base Address, IRQ [3F8h,3]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

▪ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

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NOTE:

Identical baud rate setting must be set on the host (a management computer running a terminal software) and the slave

▪ Redirection After BIOS POST [Always]

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

- | | | | |
|---|--------------------|----------------|--|
| ➔ | Disabled | | The console is not redirected after POST |
| ➔ | Boot Loader | | Redirection is active during POST and during Boot Loader |
| ➔ | Always | DEFAULT | Redirection is always active (Some OSES may not work if set to Always) |

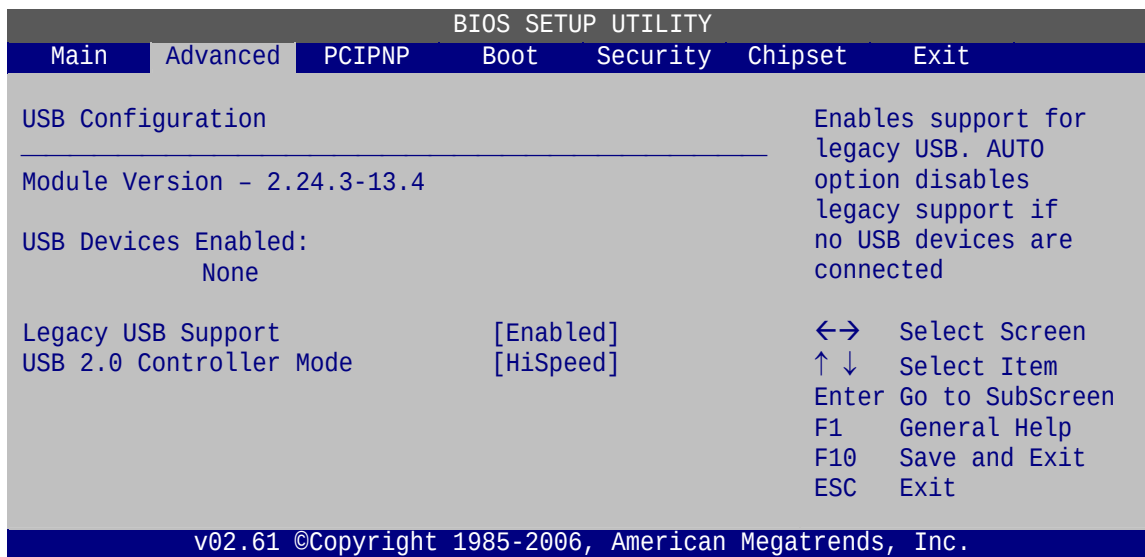
▪ Terminal Type [ANSI]

Use the **Terminal Type** BIOS option to specify the remote terminal type.

- | | | | |
|---|----------------|----------------|-------------------------------------|
| ➔ | ANSI | DEFAULT | The target terminal type is ANSI |
| ➔ | VT100 | | The target terminal type is VT100 |
| ➔ | VT-UTF8 | | The target terminal type is VT-UTF8 |

5.3.7 USB Configuration

Use the **USB Configuration** menu (BIOS Menu 10) to read USB configuration information and configure the USB settings.



BIOS Menu 10: USB Configuration

- **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

- ➔ **Disabled** Legacy USB support disabled
- ➔ **Enabled** **DEFAULT** Legacy USB support enabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

- **USB2.0 Controller Mode [HiSpeed]**

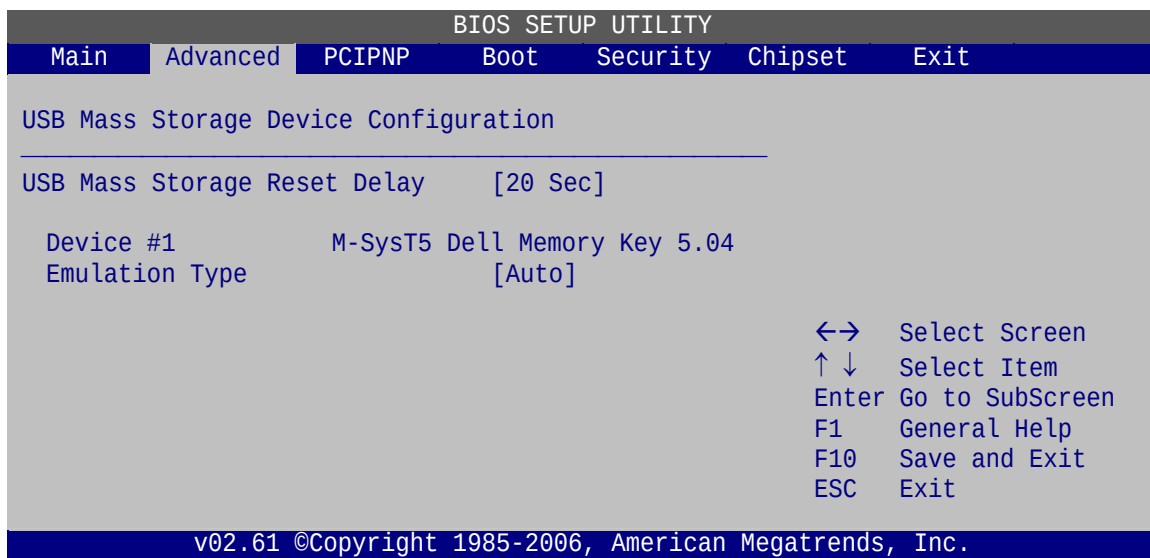
Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

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- ➔ **FullSpeed** The controller is capable of operating at 12 Mb/s
- ➔ **HiSpeed** **DEFAULT** The controller is capable of operating at 480 Mb/s

5.3.7.1 USB Mass Storage Device Configuration

Use the **USB Mass Storage Device Configuration** menu (BIOS Menu 11) to configure USB mass storage class devices.



BIOS Menu 11: USB Mass Storage Device Configuration

▪ USB Mass Storage Reset Delay [20 Sec]

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

- ➔ **10 Sec** POST waits 10 seconds for the USB mass storage device after the start unit command.
- ➔ **20 Sec** **DEFAULT** POST waits 20 seconds for the USB mass storage device after the start unit command.
- ➔ **30 Sec** POST waits 30 seconds for the USB mass storage device after the start unit command.
- ➔ **40 Sec** POST waits 40 seconds for the USB mass storage device after the start unit command.

- **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

- **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

➔	Auto	DEFAULT	BIOS auto-detects the current USB.
➔	Floppy		The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.
➔	Forced FDD		Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.
➔	Hard Disk		Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.
➔	CDROM		Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

5.4 PCI/PnP

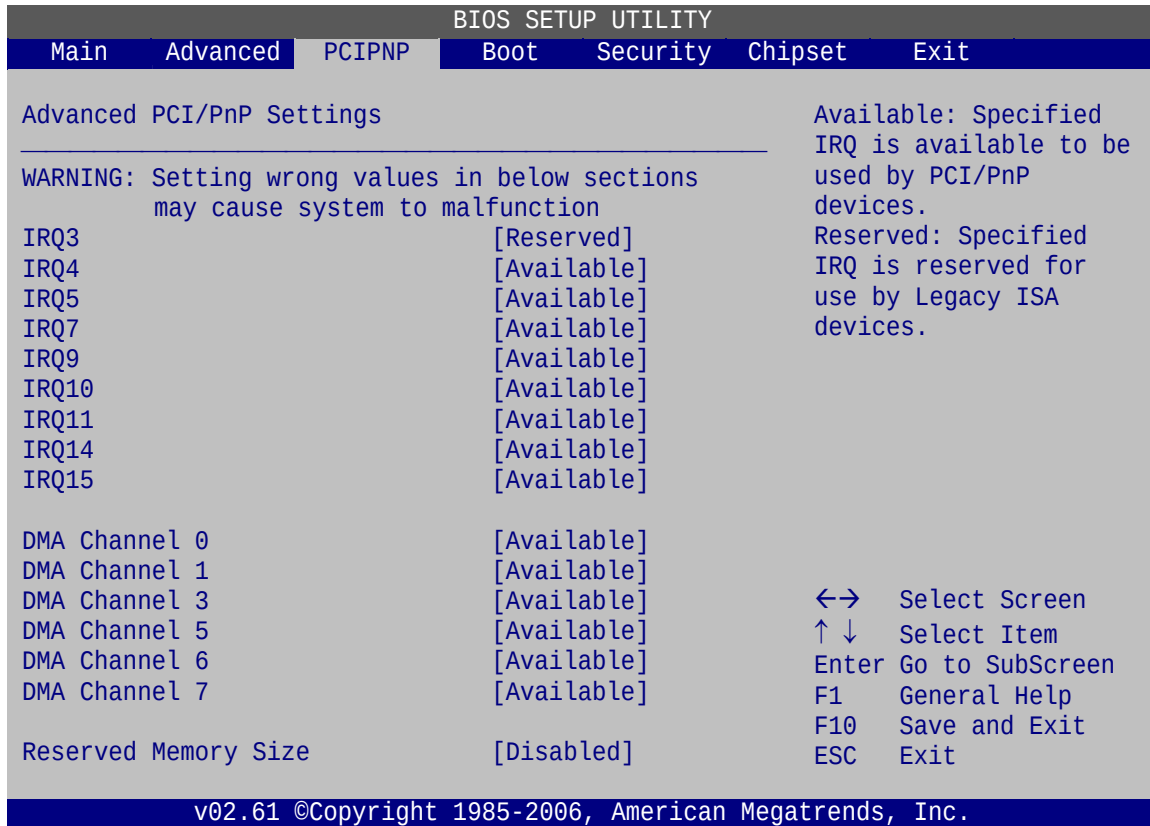
Use the **PCI/PnP** menu (BIOS Menu 12) to configure advanced PCI and PnP settings.



WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.

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BIOS Menu 12: PCI/PnP Configuration

▪ IRQ# [Available]

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

- ➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices
- ➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7

- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

▪ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

- | | | | |
|---|------------------|----------------|--|
| ➔ | Available | DEFAULT | The specified DMA is available to be used by PCI/PnP devices |
| ➔ | Reserved | | The specified DMA is reserved for use by Legacy ISA devices |

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

▪ **Reserved Memory Size [Disabled]**

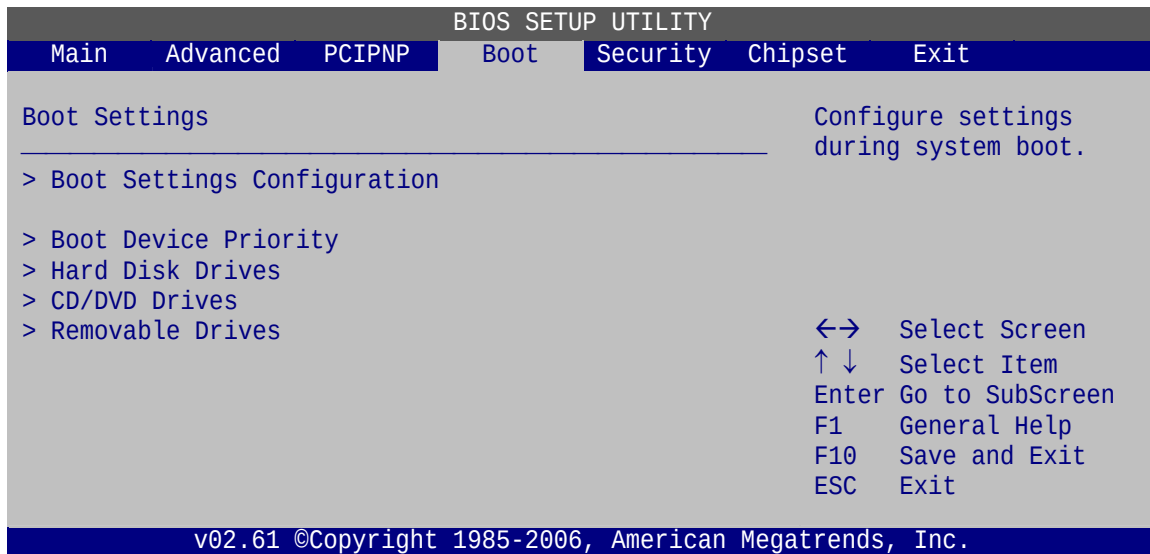
Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

- | | | | |
|---|-----------------|----------------|---|
| ➔ | Disabled | DEFAULT | No memory block reserved for legacy ISA devices |
| ➔ | 16K | | 16 KB reserved for legacy ISA devices |
| ➔ | 32K | | 32 KB reserved for legacy ISA devices |
| ➔ | 64K | | 54 KB reserved for legacy ISA devices |

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5.5 Boot

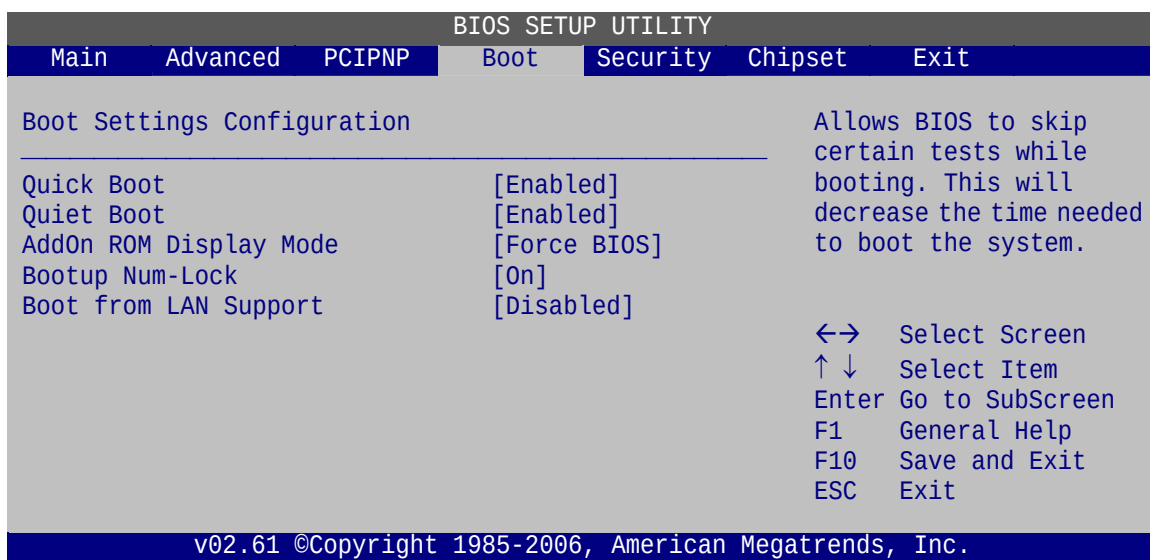
Use the **Boot** menu (BIOS Menu 13) to configure system boot options.



BIOS Menu 13: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (BIOS Menu 14) to configure advanced system boot options.



BIOS Menu 14: Boot Settings Configuration

- **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

- | | | | |
|---|-----------------|----------------|---|
| ➔ | Disabled | | No POST procedures are skipped |
| ➔ | Enabled | DEFAULT | Some POST procedures are skipped to decrease the system boot time |

- **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- | | | | |
|---|-----------------|----------------|---|
| ➔ | Disabled | DEFAULT | Normal POST messages displayed |
| ➔ | Enabled | | OEM Logo displayed instead of POST messages |

- **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

- | | | | |
|---|---------------------|----------------|---|
| ➔ | Force BIOS | DEFAULT | The system forces third party BIOS to display during system boot. |
| ➔ | Keep Current | | The system displays normal information during system boot. |

- **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

- | | | |
|---|------------|---|
| ➔ | Off | Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged. |
|---|------------|---|

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- ➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

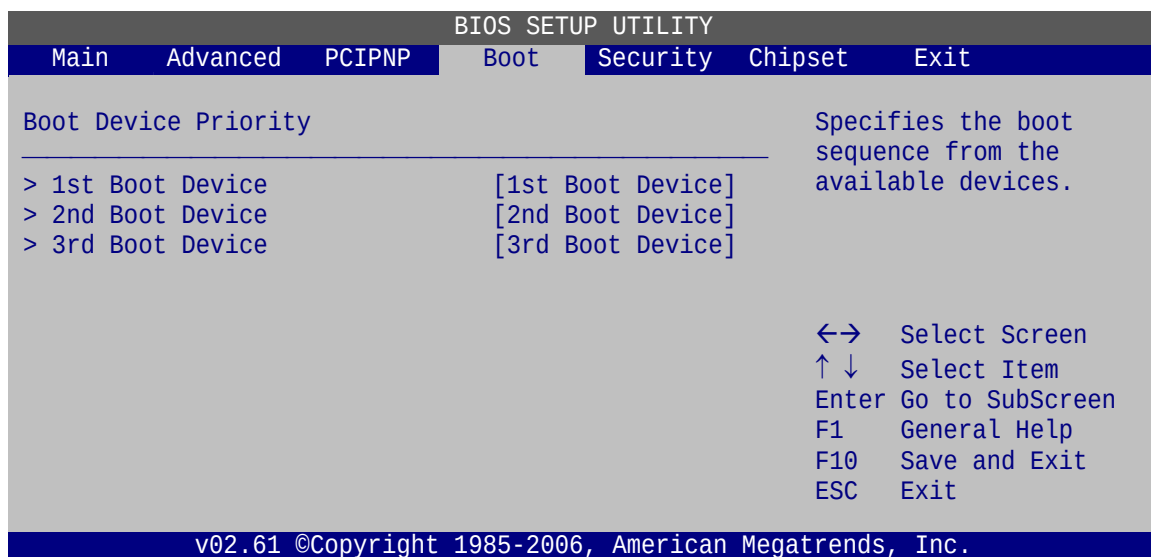
▪ **Boot From LAN Support [Disabled]**

Use the **BOOT From LAN Support** option to enable the system to be booted from a remote system.

- ➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the LAN
- ➔ **Enabled** Can be booted from a remote system through the LAN

5.5.2 Boot Device Priority

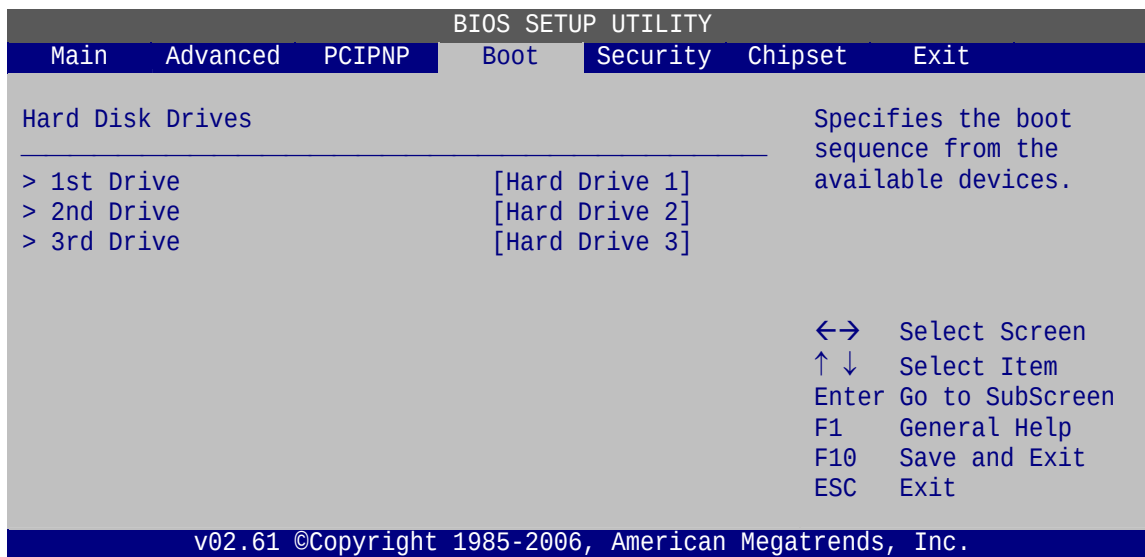
Use the **Boot Device Priority** menu (BIOS Menu 15) to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.



BIOS Menu 15: Boot Device Priority Settings

5.5.3 Hard Disk Drives

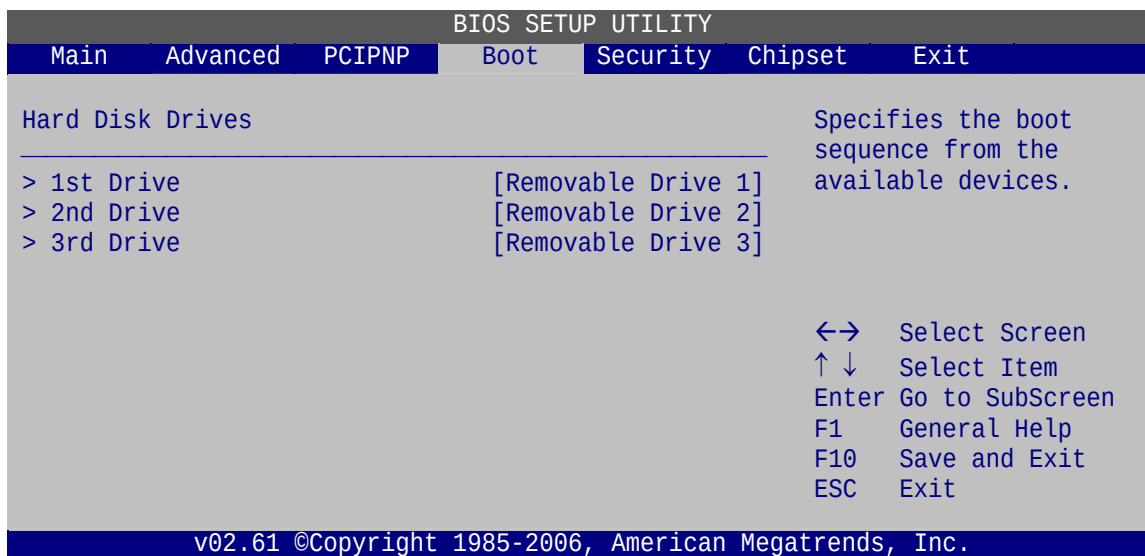
Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. Only installed hard drives are shown.



BIOS Menu 16: Hard Disk Drives

5.5.4 Removable Drives

Use the **Removable Drives** menu (BIOS Menu 17) to specify the boot sequence of the removable drives. Only connected drives are shown.



BIOS Menu 17: Removable Drives

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5.5.5 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

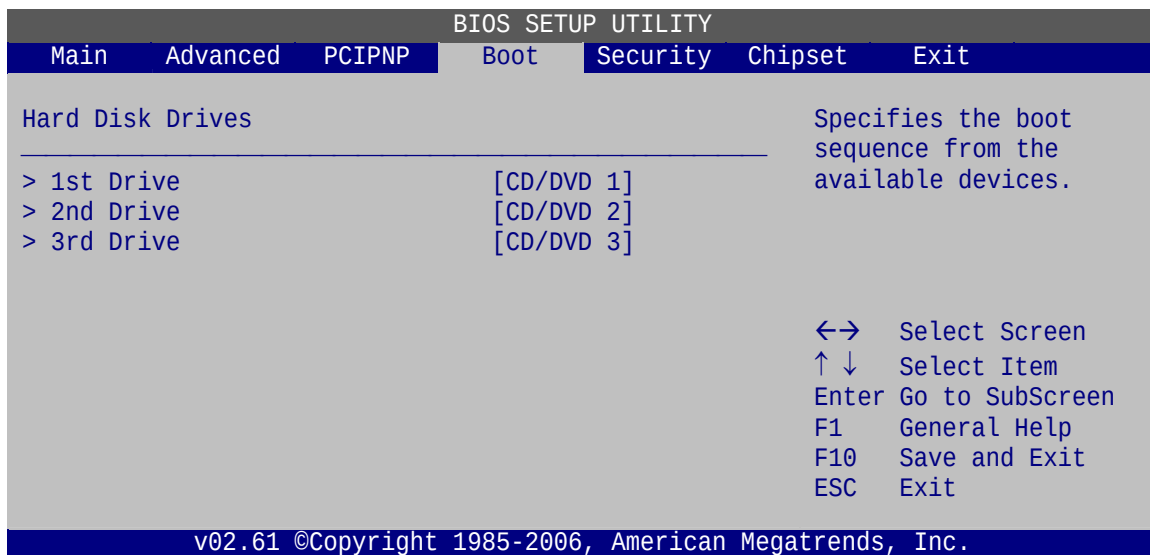
- 1st Drive [CD/DVD: PM-(part ID)]
- 2nd Drive [HDD: PS-(part ID)]
- 3rd Drive [HDD: SM-(part ID)]
- 4th Drive [HDD: SM-(part ID)]



NOTE:

Only the drives connected to the system are shown. For example, if only two CDs or DVDs are connected only “**1st Drive**” and “**2nd Drive**” are listed.

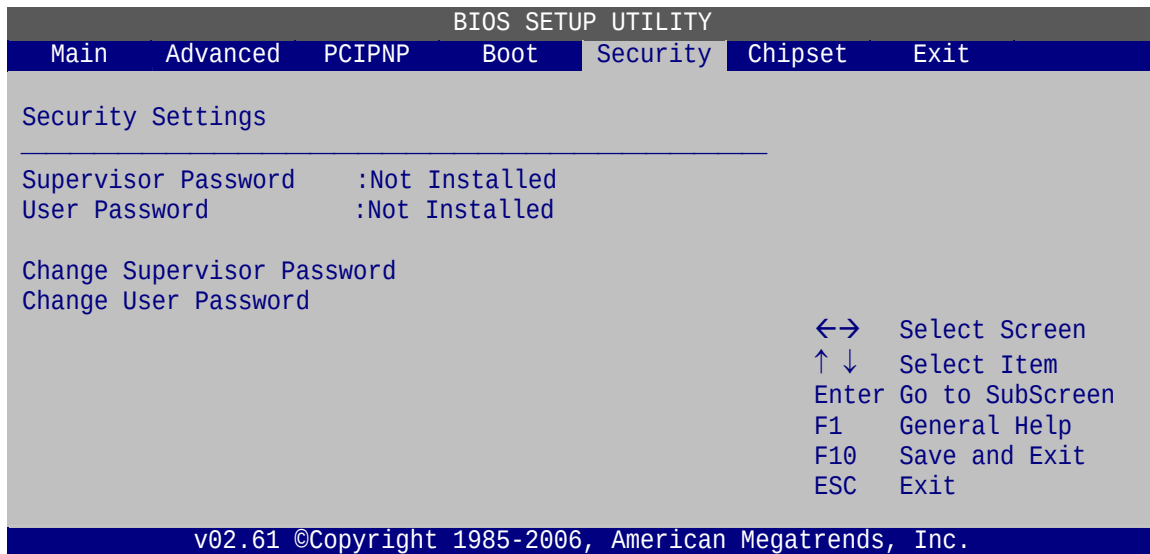
The boot sequence from the available devices is selected. If the “**1st Drive**” option is selected a list of available CD/DVD drives is shown. Select the first CD/DVD drive the system boots from. If the “**1st Drive**” is not used for booting this option may be disabled.



BIOS Menu 18: CD/DVD Drives

5.6 Security

Use the **Security** menu (BIOS Menu 19) to set system and user passwords.



BIOS Menu 19: Security

- **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

- **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipset

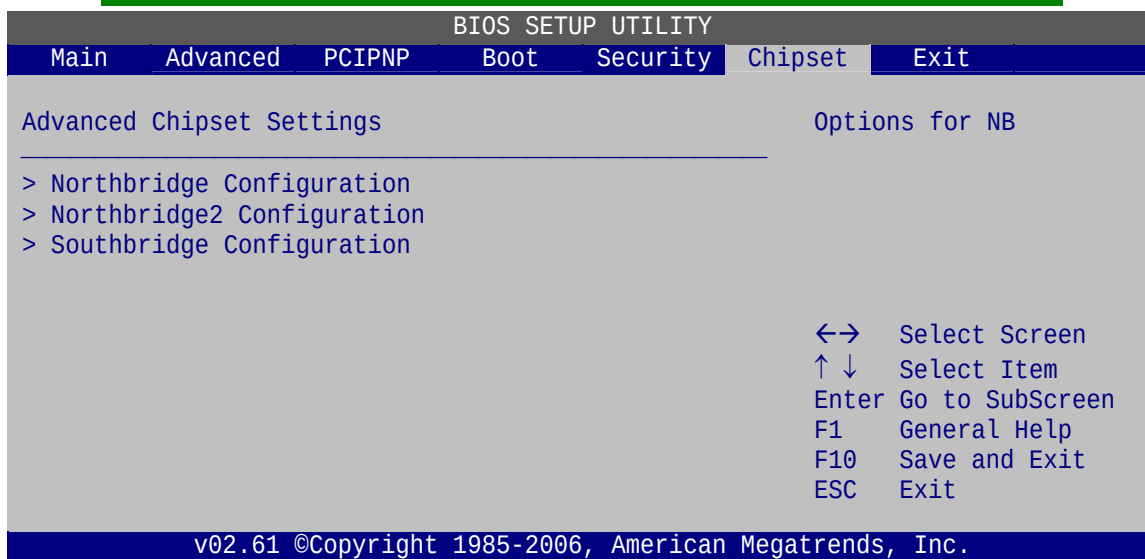
Use the **Chipset** menu (BIOS Menu 20) to access the Northbridge and Southbridge configuration menus

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WARNING!

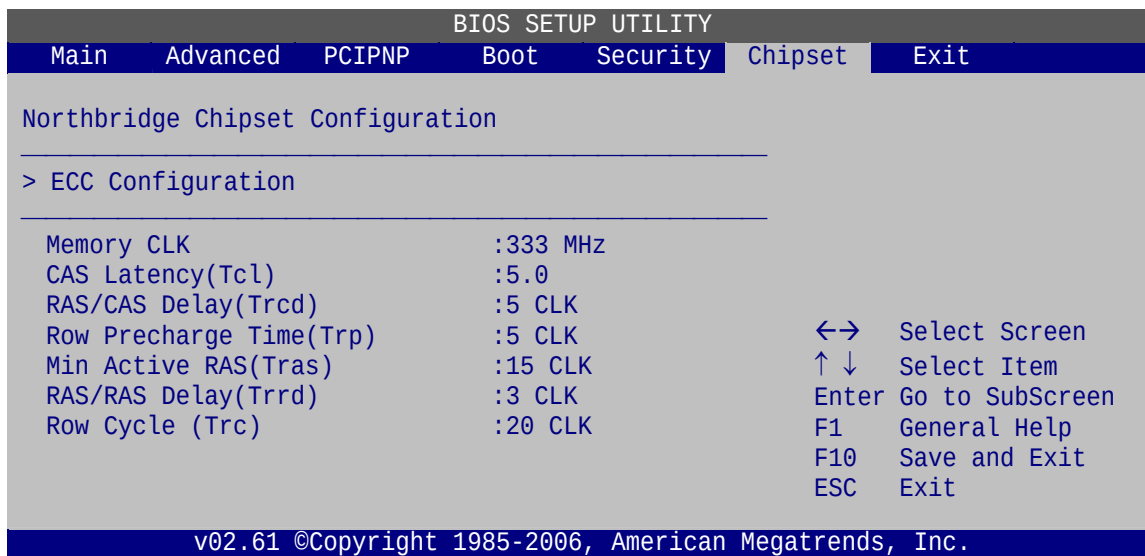
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 20: Chipset

5.7.1 Northbridge Configuration

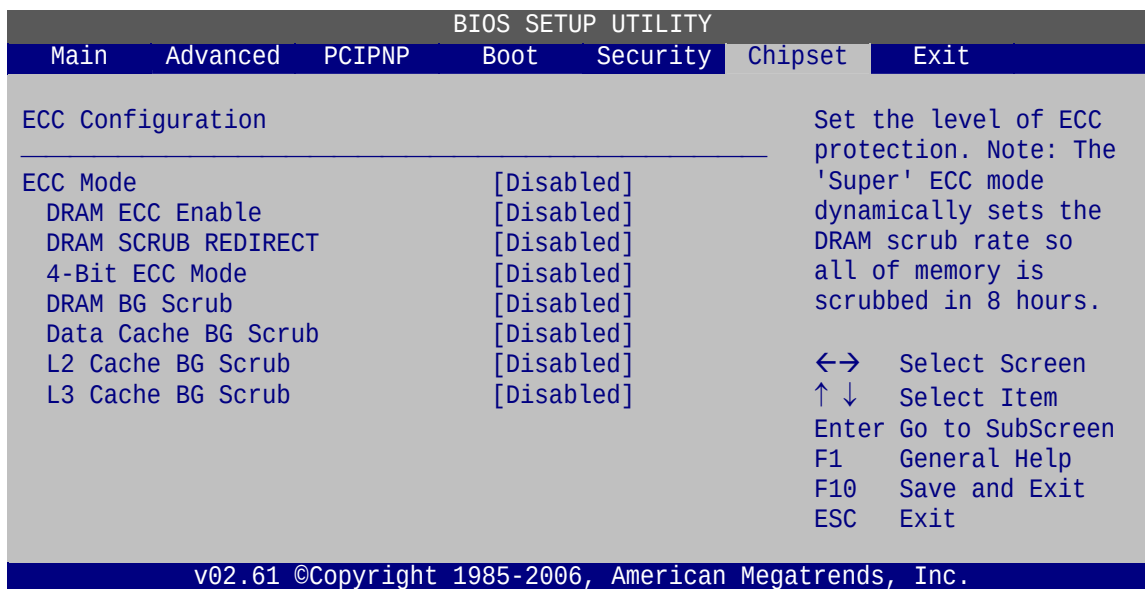
Use the Northbridge Configuration menu (BIOS Menu 21) to view ECC parameters.



BIOS Menu 21: Northbridge Configuration

5.7.1.1 ECC Configuration

Use the ECC Configuration menu (BIOS Menu 22) to set the ECC parameters.



BIOS Menu 22: ECC Configuration

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▪ ECC Mode [Disabled]

These options provide presets for the ECC memory. Select a mode to see the presets.

- Disabled **DEFAULT**
- Basic
- Good
- Super
- Max
- User

▪ DRAM ECC Enable [Enabled]

Use the **DRAM ECC Enable** option to enable the hardware to report and correct memory errors and thereby automatically maintain the system.

- ➔ **Disabled** **DEFAULT** System cannot report and correct memory errors, disabled by default
- ➔ **Enabled** Enabled for all ECC modes

▪ DRAM SCRUB REDIRECT [Disabled]

Use the **DRAM SCRUB REDIRECT** option to enable the system to immediately correct DRAM ECC errors when they occur, even when background scrubbing is on.

- ➔ **Disabled** **DEFAULT** System cannot immediately correct DRAM ECC errors, disabled by default and for Basic mode
- ➔ **Enabled** Enabled for Good, Super, Max and User modes by default

▪ 4-Bit ECC Mode

Use the **4-Bit ECC Mode** to enable or disable the 4-Bit ECC mode (a.k.a. CHIPKILL ECC MODE)

- ➔ **Disabled** **DEFAULT** 4-Bit ECC mode disabled

➔ **Enabled**

4-Bit ECC mode enabled by default for Basic, Good, Super, Max and User modes

▪ **DRAM BG Scrub [Disabled]**

Use the **DRAM BG Scrub** option to enable the system to immediately correct memory errors so later reads are correct. Doing this while memory is not being used improves performance.

- | | |
|------------|-----------------------|
| ▪ Disabled | DEFAULT |
| ▪ 40ns | |
| ▪ 80ns | |
| ▪ 160ns | |
| ▪ 320ns | |
| ▪ 640ns | |
| ▪ 1.28μs | |
| ▪ 2.56μs | |
| ▪ 5.12μs | |
| ▪ 10.2μs | |
| ▪ 20.5μs | |
| ▪ 41.0μs | |
| ▪ 81.9μs | |
| ▪ 163.8μs | Max mode |
| ▪ 327.7μs | |
| ▪ 655.4μs | |
| ▪ 1.31ms | Good Mode, Super Mode |
| ▪ 2.62ms | |
| ▪ 5.24ms | |
| ▪ 10.49ms | |
| ▪ 20.97ms | |
| ▪ 42.00ms | |
| ▪ 84.00ms | |

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▪ L2 Cache BG Scrub [Disabled]

Use the **L2 Cache BG Scrub** option to enable the system to correct the L2 Data cache when idle.

- | | |
|------------|----------------|
| ▪ Disabled | DEFAULT |
| ▪ 40ns | |
| ▪ 80ns | |
| ▪ 160ns | |
| ▪ 320ns | |
| ▪ 640ns | |
| ▪ 1.28μs | |
| ▪ 2.56μs | Max mode |
| ▪ 5.12μs | |
| ▪ 10.2μs | |
| ▪ 20.5μs | |
| ▪ 41.0μs | |
| ▪ 81.9μs | |
| ▪ 163.8μs | |
| ▪ 327.7μs | |
| ▪ 655.4μs | |
| ▪ 1.31ms | |
| ▪ 2.62ms | |
| ▪ 5.24ms | |
| ▪ 10.49ms | |
| ▪ 20.97ms | |
| ▪ 42.00ms | |
| ▪ 84.00ms | |

▪ L1 Cache BG Scrub [Disabled]

Use the **L1 Cache BG Scrub** option to enable the system to correct the L1 Data cache when idle.

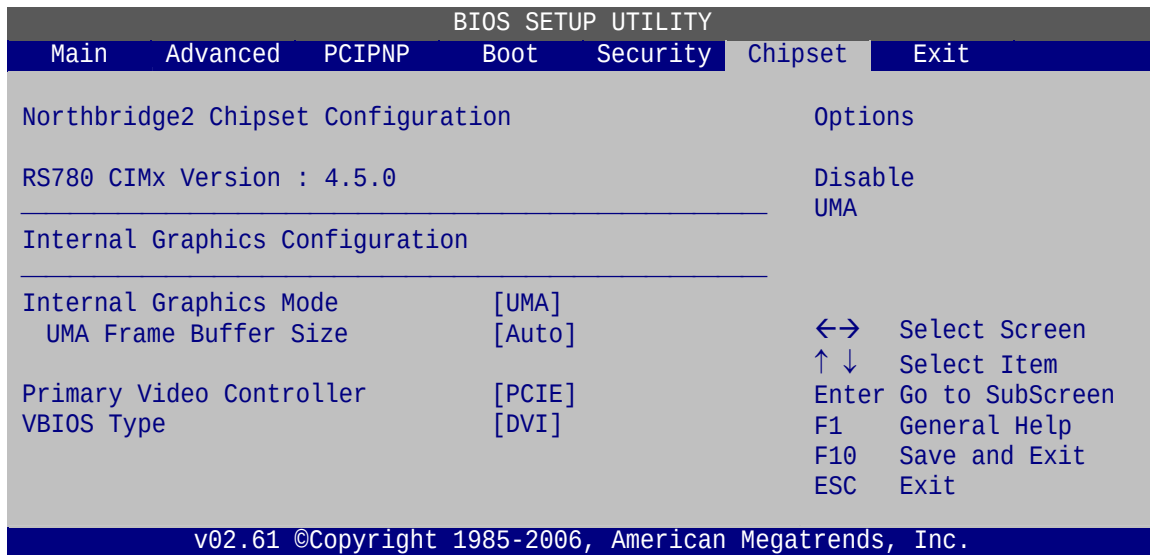
- | | |
|------------|----------------|
| ▪ Disabled | DEFAULT |
| ▪ 40ns | |
| ▪ 80ns | |

- 160ns
 - 320ns
 - 640ns
 - 1.28μs
 - 2.56μs
 - 5.12μs
 - 10.2μs
 - 20.5μs
 - 41.0μs
 - 81.9μs
 - 163.8μs
 - 327.7μs
 - 655.4μs
 - 1.31ms
 - 2.62ms
 - 5.24ms
 - 10.49ms
 - 20.97ms
 - 42.00ms
 - 84.00ms
- Max mode

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5.7.2 Northbridge2 Configuration

Use the **Northbridge Chipset Configuration** menu (BIOS Menu 23) to configure the Northbridge chipset.



BIOS Menu 23:Northbridge Chipset Configuration

- **Internal Graphics Mode [UMA]**

Selects Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

- Disabled
- UMA **DEFAULT**

- **UMA Frame Buffer Size [Auto]**

Specifies how much memory is allocated to the graphics.

- Auto **DEFAULT**
- 32MB
- 64MB
- 128MB
- 256MB
- 512MB

- **Primary Video Controller [PCIE]**

Selects which graphics port to select first when booting the computer.

- ➔ **PCIE** **DEFAULT** If there is a PCIe x16 graphics card installed, it is selected first
- ➔ **IGFX** Internal graphics are selected first

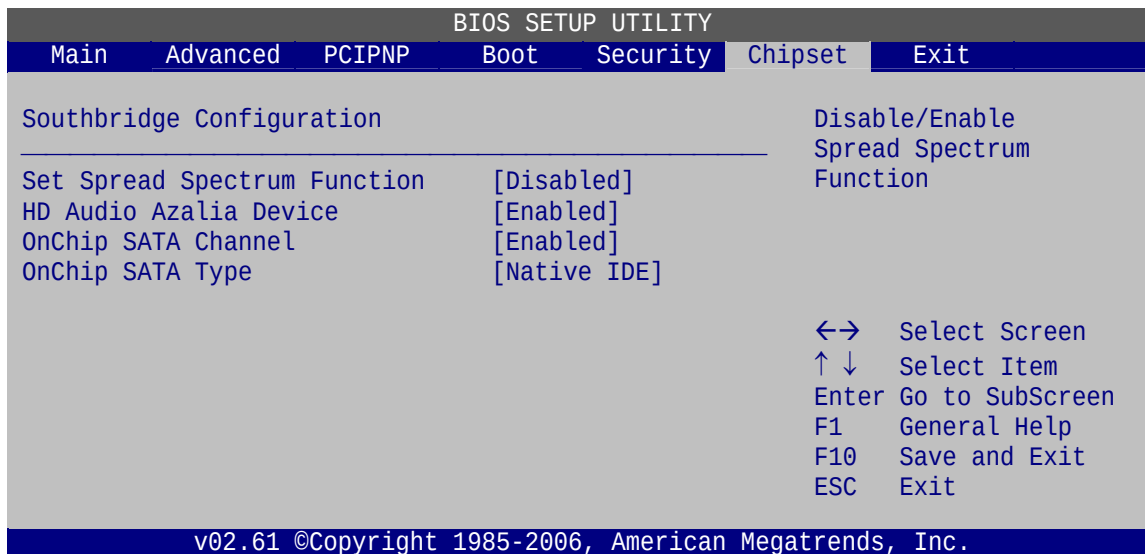
- **VBIOS Type [DVI]**

Selects between the DVI and HDMI graphics ports. Only one can be selected at a time.

- ➔ **DVI** **DEFAULT** The DVI port is activated, HDMI is disabled
- ➔ **HDMI** The HDMI port is activated, DVI is disabled

5.7.3 Southbridge Configuration

The **Southbridge Configuration** menu (BIOS Menu 24) the Southbridge chipset to be configured.



BIOS Menu 24:Southbridge Chipset Configuration

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- **Set Spread Spectrum Function [Disabled]**

Reduces the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

- ➔ **Disabled** **DEFAULT** EMI not reduced
- ➔ **Enabled** EMI reduced

- **HD Audio Azalia Device [Enabled]**

Enables and disables the onboard audio.

- **Enabled** **DEFAULT**
- **Disabled**

- **OnChip SATA Channel [Enabled]**

Enables and disables the SATA drives.

- ➔ **Disabled** SATA is disabled
- ➔ **Enabled** **DEFAULT** The SATA chip is enabled and the SATA drives can be used.

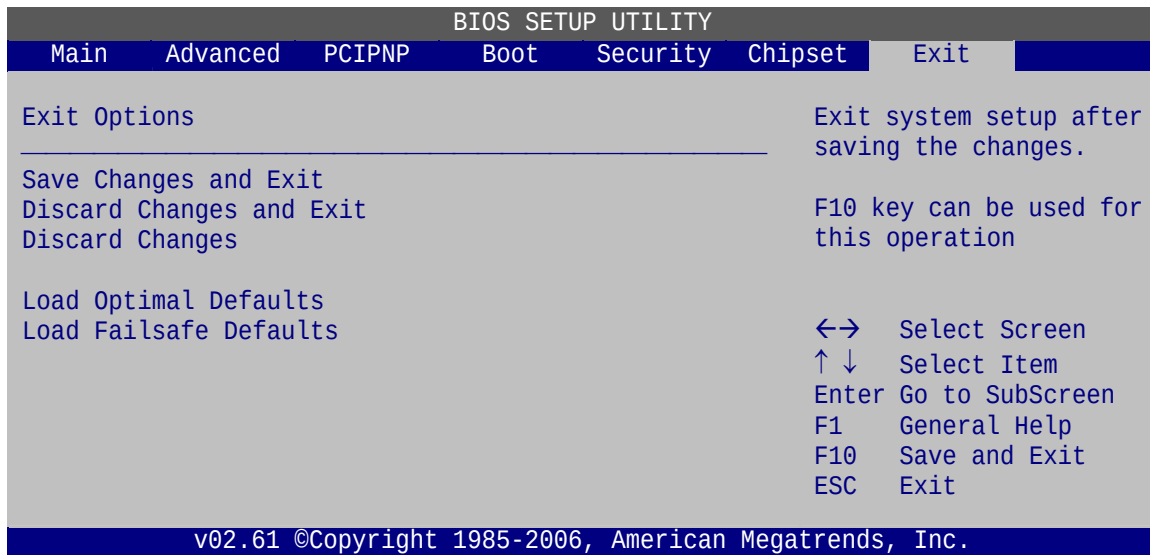
- **OnChip SATA Type [Native IDE]**

Selects the setup of the SATA drives.

- ➔ **Native IDE** **DEFAULT** The SATA drives emulates the function of IDE drives
- ➔ **RAID** Sets up the SATA drives in a RAID configuration
- ➔ **AHCI** Sets up the SATA drives as AHCI

5.8 Exit

Use the **Exit** menu (BIOS Menu 25) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 25:Exit

- **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

- **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

- **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

- **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

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- **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix**A**

BIOS Options

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Below is a list of BIOS configuration options in the BIOS chapter.

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Appendix

B

Terminology

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AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

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LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Digital I/O Interface

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C.1 Introduction

The DIO connector on the KINO-780AM2 is interfaced to GPIO ports on the Fintek F75111R. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

C.2 DIO Connector Pinouts

The following table shows the pinouts of the digital I/O.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	20	GPIO27
4	Output 2	21	GPIO26
5	Output 1	22	GPIO25
6	Output 0	23	GPIO24
7	Input 3	24	GPIO23
8	Input 2	8	GPIO22
9	Input 1	7	GPIO21
10	Input 0	6	GPIO20

Table C-1: Digital I/O Connector Pinouts

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	AX, 6F08H	Sets the digital port as input
INT	15H	Initiates the INT 15H BIOS call

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	AX, 6F09H	Sets the digital port as output
MOV	BL, 09H	
INT	15H	Initiates the INT 15H BIOS call

Appendix

D

Watchdog Timer


NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

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NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

; INITIAL TIMER PERIOD COUNTER

;

W_LOOP:

;

```
MOV      AX, 6F02H      ;setting the time-out value
MOV      BL, 30         ;time-out value is 48 seconds
INT      15H
```

;

; ADD THE APPLICATION PROGRAM HERE

;

```
CMP      EXIT_AP, 1      ;is the application over?
JNE      W_LOOP          ;No, restart the application
```

```
MOV      AX, 6F02H      ;disable Watchdog Timer
MOV      BL, 0           ;
INT      15H
```

;

; EXIT ;



Appendix

E

Hazardous Materials Disclosure

E.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O
O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006						

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此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						